User Guide

Matrix Switchers

MPX 866 A

Media Presentation Matrix Switcher

Extron® Electronics
INTERFACING, SWITCHING AND CONTROL

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01 11

Safety Instructions • English

This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.

This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

Caution

Read Instructions • Read and understand all safety and operating instructions before using the equipment.

Retain Instructions • The safety instructions should be kept for future reference.

Follow Warnings • Follow all warnings and instructions marked on the equipment or in the user information.

Avoid Attachments • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

Warning

Power sources • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.

Power disconnection • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).

Power cord protection • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.

Servicing • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.

Slots and openings • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.

Lithium battery • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Consignes de Sécurité • Français

Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).

Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.

Attention

Lire les instructions• Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.

Conserver les instructions• Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.

Respecter les avertissements • Observer tous les avertissements et consignes marqués sur le matériel ou présentés dans la documentation utilisateur.

Eviter les pièces de fixation • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

Avertissement

Alimentations • Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité : n'essayez pas de la contourner ni de la désactiver.

Déconnexion de l'alimentation• Pour mettre le matériel hors tension sans danger, déconnectez tous les cordons d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.

Protection du cordon d'alimentation • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas écrasés ou pincés par des objets.

Réparation-maintenance • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à ces opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à de hautes tensions et autres dangers.

Fentes et orifices • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.

Lithium Batterie • Il a danger d'explosion s'll y a remplacment incorrect de la batterie. Remplacer uniquement avec une batterie du meme type ou d'un ype equivalent recommande par le constructeur. Mettre au reut les batteries usagees conformement aux instructions du fabricant.

Sicherheitsanleitungen • Deutsch

Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.

Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.

Achtung

Lesen der Anleitungen • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits-und Bedienungsanleitungen genau durchlesen und verstehen.

Aufbewahren der Anleitungen • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.

Befolgen der Warnhinweise • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.

Keine Zusatzgeräte • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.

Vorsicht

Stromquellen • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdanschluß, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.

Stromunterbrechung • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stomversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.

Schutz des Netzkabels • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegengestellt werden können.

Wartung • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, dieses Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.

Schlitze und Öffnungen • Wenn das Gerät Schlitze oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Objekten blockiert werden.

Litium-Batterie • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

Instrucciones de seguridad • Español

Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.

Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.

Precaucion

Leer las instrucciones • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.

Conservar las instrucciones • Conservar las instrucciones de seguridad para futura consulta.

Obedecer las advertencias • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.

Evitar el uso de accesorios • No usar herramientas o accesorios que no sean especificamente recomendados por el fabricante, ya que podrian implicar riesgos.

Advertencia

Alimentación eléctrica • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puentearia ni eliminaria.

Desconexión de alimentación eléctrica • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.

Protección del cables de alimentación • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.

Reparaciones/mantenimiento • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario deba acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.

Ranuras y aberturas • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalientamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.

Batería de litio • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Desachar las baterías usadas siguiendo las instrucciones del fabricante.

安全须知 • 中文

这个符号提示用户该设备用户手册中有重要的操作和维护说明。

这个符号警告用户该设备机壳内有暴露的危险电压，有触电危险。

注意

阅读说明书 • 用户使用该设备前必须阅读并理解所有安全和使用说明。

保存说明书 • 用户应保存安全说明书以备将来使用。

遵守警告 • 用户应遵守产品和用户指南上的所有安全和操作说明。

避免追加 • 不要使用该产品厂商没有推荐的工具或追加设备，以避免危险。

警告

电源 • 该设备只能使用产品上标明的电源。 设备必须使用有地线的供电系统供电。 第三条线（地线）是安全设施，不能不用或跳过 。

拔掉电源 • 为安全地从设备拔掉电源，请拔掉所有设备后或桌面电源的电源线，或任何接到市电系统的电源线。

电源线保护 • 妥善布线， 避免被踩踏，或重物挤压。

维护 • 所有维修必须由认证的维修人员进行。 设备内部没有用户可以更换的零件。为避免出现触电危险不要自己试图打开设备盖子维修该设备。

通风孔 • 有些设备机壳上有通风槽或孔，它们是用来防止机内敏感元件过热。 不要用任何东西挡住通风孔。

锂电池 • 不正确的更换电池会有爆炸的危险。必须使用与厂家推荐的相同或相近型号的电池。按照生产厂的建议处理废弃电池。

FCC Class A Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

The Class A limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction guide, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

NOTE: This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to ensure compliance with FCC emissions limits.

For more information on safety guidelines, regulatory compliances, EMI/EMF compliance, accessibility, and related topics, **click here**.

Notational Conventions Used in this Guide

TIP: A tip provides a suggestion to make setting up or working with the device easier.

NOTE: A note draws attention to important information.

CAUTION: A caution warns of things or actions that might damage the equipment.

WARNING: A warning warns of things or actions that might cause injury, death, or other severe consequences.

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Introduction

This section introduces the Extron® MPX 866 A Media Presentation Matrix Switcher, including:

- About this Guide
- About the Media Presentation Matrix Switcher
- Definitions
- Features

About this Guide

This guide contains installation, configuration, and operating information for the Extron MPX 866 A media presentation matrix switcher (see figure 1).

In this guide, the MPX 866 A may be referred to as "the MPX" or "the switcher".

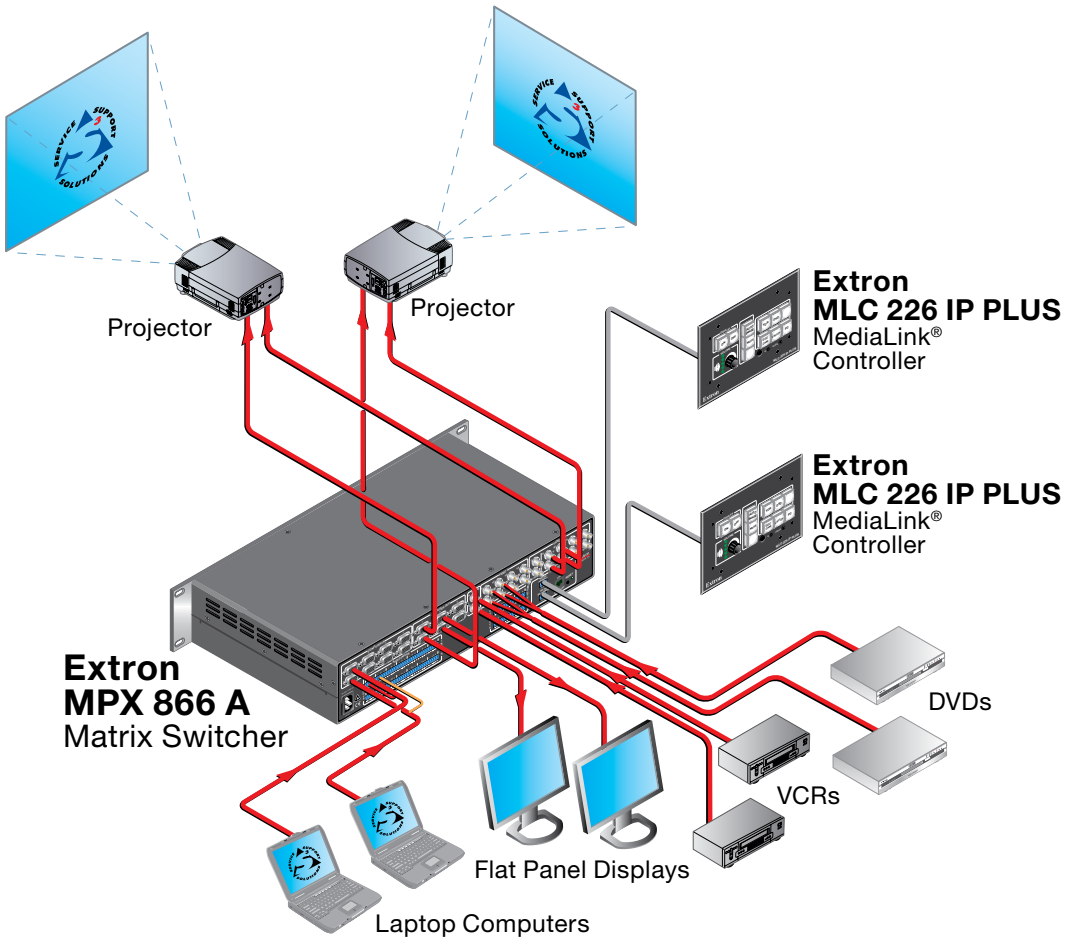


Figure 1. Typical MPX 866 A Application

About the Media Presentation Matrix Switcher

A media presentation switcher combines multiple A/V switchers, of different video formats, and a program audio switcher with mute controls in one unit.

A matrix switcher distributes any input to any combination of outputs and can route multiple input/output configurations simultaneously.

The MPX 866 A media presentation matrix switcher combines three matrix switchers with the following switching capabilities in a single product:

- An 8-input by 6-output VGA matrix switcher, comprising the computer video group (computer inputs subgroup and computer/audio outputs subgroup)
- A 6-input by 6-output S-video and composite video matrix switcher, comprising the low resolution video group (low resolution video inputs subgroup and low resolution video outputs subgroup)
- A 14-input by 6-output primary audio matrix switcher

NOTE: Video ties can only be made within the same group.
Audio ties can only be made to outputs in the computer/audio subgroup (outputs 1 through 6).

The switcher is a solution to complex simultaneous computer video, low resolution video, and audio routing applications. Any input(s) within one of the two groups, computer video and video, can be switched to any one or all outputs within that same group. Each input and output is individually isolated and buffered; switching is accomplished with virtually no crosstalk or signal noise between channels.

The computer video group has a minimum bandwidth of 300 MHz (-3 dB).
The low resolution video group has a minimum bandwith of 150 MHz (-3 dB).

The MPX inputs and outputs computer (VGA) video in the computer video group on 15-pin HD connectors. The switcher inputs and outputs S-video and composite video in the low resolution video group on female BNC connectors. The MPX inputs and outputs balanced or unbalanced stereo or mono audio on 5-pole, 3.5 mm captive screw connectors.

The audio switching can either be linked with the video (audio follow) or independent of the video (audio breakaway). The 14 audio inputs can be switched along with inputs from either video group (although ties can only be made to the computer/audio subgroup). Adjustable input audio gain and attenuation compensates for level differences between audio inputs.

The switcher has two RS-232 ports (primary and secondary), and a local area network (LAN) Ethernet port for remote control and reporting. The matrix switcher is programmed with the Extron Simple Instruction Set (SIS™), a set of basic ASCII code commands that provide simple control through a control system or PC without programming long, obscure strings of code. SIS commands can be entered via the RS-232 ports or the LAN port.

The LAN port can be connected through a LAN or wide area network (WAN).

The MPX can be operated by any of the following connected to either of the RS-232 ports or to the LAN port:

- A control system
- A PC
- An Extron MKP 2000 remote control panel
- An Extron MKP 3000 remote control panel
- **(RS-232 only)** An Extron MCP 1000 remote control panel or MKP 1000 remote keypad

The switcher is housed in a rack-mountable, 2U high metal enclosure with mounting flanges for standard 19-inch racks. A rack mounting kit is included with the switcher.

The switcher has an internal 100 VAC to 240 VAC, 50/60 Hz, 15 watts power supply that provides worldwide power compatibility.

Definitions

The following terms, which apply to all Extron matrix switchers, are used throughout this guide:

Tie — An input-to-output connection

Set of ties — An input tied to two or more outputs. (An output can never be tied to more than one input.)

Configuration — One or more ties or one or more sets of ties

Current configuration — The configuration that is currently active in the switcher (also called "configuration 0")

Global memory preset — A configuration that has been stored. Up to 32 global memory presets can be stored in the memory. Preset locations are assigned to the input buttons and (where necessary) to the output buttons. Up to 26 presets can be selected from the front panel for either saving or retrieving. When a preset is retrieved from memory, it becomes the current configuration. Presets can also be saved and recalled via any of the serial ports or the LAN port. Preset numbers larger than 26 are accessible only via RS-232 and Ethernet control.

Features

Video —

Computer video group (inputs 1 through 8, outputs 1 through 6) — The switcher inputs and outputs RGBHV (VGA), RGBS, RGsB, RsGsBs, or Y, R-Y, B-Y video on 15-pin HD connectors.

Low resolution video group (inputs 9 through 14, outputs 7 through 12) — The switcher inputs and outputs NTSC 3.58, NTSC 4.43, PAL, or SECAM S-video, composite video, or both on BNC connectors.

- **Inputs 9 and 10** (the first two low resolution group video inputs) are composite video only.
- **Input 9** is a genlock reference. All other low resolution inputs are synced to input 9.
- **Inputs 11 through 14** (the remaining low resolution group video inputs) can accept either S-video or composite video.
- **Outputs 7 and 8** (the first two low resolution video group outputs) are composite video outputs only. If the tied input is S-video, the switcher encodes it to composite. If the tied input is composite video, the switcher passes it through unprocessed.
- **Outputs 9 and 10** (the third and fourth low resolution video group video outputs) are S-video outputs only. If the tied input is S-video, the switcher passes it through unprocessed. If the tied input is composite video, the switcher decodes it to S-video.
- **Outputs 11 and 12** (the fifth and sixth low resolution group video outputs) are pass-through outputs only; the output is the same format (S-video or composite video) as the selected input.

Bandwidth —

- **Computer video group —** The switcher provides a minimum of 300 MHz (-3 dB) video bandwidth, fully loaded.
- **Low resolution video group —** The switcher provides a minimum of 150 MHz (-3 dB) video bandwidth, fully loaded.

Audio — Input and output balanced or unbalanced stereo audio on 3.5 mm, 5-pole captive screw terminals.

Audio input gain/attenuation — Individual input audio levels can be adjusted so there are no noticeable volume differences between sources. Users can set the input level of audio gain or attenuation (-18 dB to +24 dB) via the Ethernet link, RS-232 link, or the front panel.

Audio output volume — The audio volume of each output can be displayed and adjusted through a range from full output to completely silent from the front panel or via RS-232 or Ethernet control.

Switching flexibility — Provides individually buffered, independent matrix switched outputs with audio follow and audio breakaway.

NOTE: Audio switching is independent of the video groups.

- **Tie any input to any or all outputs within a video group**
- **Quick multiple tie —** Multiple inputs can be switched to multiple outputs within a video group simultaneously. This allows all displays (outputs) to change from source to source at the same time.
- **Audio follow —** Audio can be switched with its corresponding video input via front panel control or under Ethernet or RS-232 remote control.
- **Audio breakaway —** Audio can be broken away from its corresponding video signal. This feature allows any audio signal to be selected with any video signal simultaneously to one or all outputs in any combination. Audio breakaway switching can be done via front panel control or under Ethernet or RS-232 remote control.

Operational flexibility — Operations such as input/output selection, setting of presets, and adjustment of audio levels can be performed on the front panel or via the Ethernet or RS-232 link. The Ethernet and RS-232 links allow remote control via a PC or control system. The Ethernet link allows multiple remote links with two levels of password protection.

- **Front panel control —** The front panel controller supports input and output selection, preset creation and selection, and audio gain and attenuation and volume control. The front panel features slots for labels that can identify each input and output with text or graphics.
- **Windows-based control program —** For RS-232 remote control from a PC, the Extron Windows-based control software provides a graphical interface and drag-and-drop/point-and-click operation. The Windows-based control program also has an emulation mode that lets you create a switcher configuration file at the home office and then download it for use by the switcher on site.
- **Simple Instruction Set (SIS™) —** The remote control protocol uses the Extron SIS for easy programming and operation.
- **Remote control panels and keypads —** The switcher is remote controllable, using the optional MKP 2000 and MKP 3000 remote control panels. The remote control devices are easy to use and provide tactile buttons for quick selection. Each MKP can be used for input-to-output switching or one-touch switching for a particular output and selecting global presets.

Upgradable firmware — The firmware that controls all switcher operation can be upgraded in the field via RS-232 or Ethernet, without taking the switcher out of service. Firmware upgrades are available for download on the Extron website, **www.extron.com**, and they can be installed using the Windows-based control program.

Labeling — The included Extron Button-Label Generator software lets you create labels to place in the front panel I/O buttons, with names, alphanumeric characters, or color bitmaps for easy and intuitive input and output selection. Alternatively, labels can be made with any Brother® P-Touch® or comparable labeler.

Global memory presets — 32 global memory presets are a time-saving feature that lets you set up and store input/output configurations in advance. You can then recall those configurations, when needed, with a few simple steps.

Rack mounting — Rack mountable in any conventional 19-inch wide rack.

Front panel security lockout (Executive mode) — A security lockout feature can be implemented, locking the front panel. The front panel lock requires a special button combination or SIS command to unlock the switcher before it can be operated from the front panel. This feature is useful if a switcher is installed in an open area, where operation by unauthorized personnel may be a problem.

Power — The 100 VAC to 240 VAC, internal power supply provides worldwide power compatibility.

Installation

This sections details the installation of the MPX 866 A switchers, including:

- **Setup and Installation Checklist**
- **Rear Panel Cabling and Features**
- **Front Panel Configuration Port**

Setup and Installation Checklist

Get Ready

- ☐ Familiarize yourself with the matrix switcher.
- ☐ Obtain IP setting information for the matrix switcher from the local network administrator. Read "**Ethernet Connection**".

Perform Physical Installation

- ☐ If desired, install the switcher in a rack (**page 126**).
- ☐ Cable input and output (I/O) devices to the I/O ports (**page 7**).
- ☐ As desired, connect computers, control systems, or both to the rear panel Remote ports (**page 11**), LAN port (**page 12**), and front panel Configuration port (**page 14**).
- ☐ Connect power (**page 13**).
- ☐ Test the switcher by creating a tie (**page 25**).

Install Software

- ☐ Install the Matrix Switchers Control Program (**page 74**).

Rear Panel Cabling and Features

All switcher connectors are on the rear panel (see figure 2).

CAUTIONS:
- Use electrostatic discharge (ESD) precautions (be electrically grounded) when making connections. Electrostatic discharge can damage equipment, even if you cannot feel, see, or hear it.
- Remove system power before making all connections

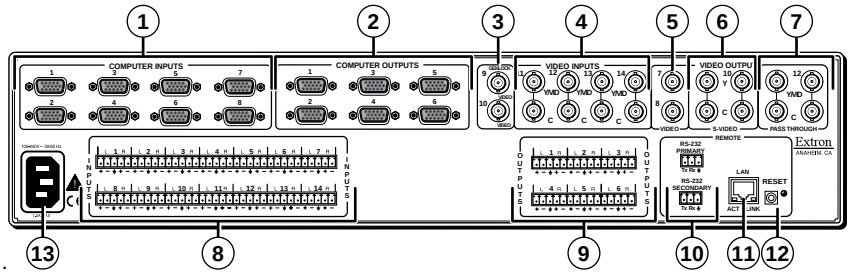


Figure 2. MPX 866 A Media Presentation Matrix Switcher

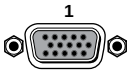
Video Input and Output

NOTE: The switcher does not alter the computer video inputs in any way. The signal output is in the same format as the input.

The switcher can connect to up to as many as eight computer video sources and output to as many as six video devices.

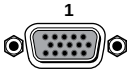
Computer video group

① **RGB video inputs —** Connect the analog computer-video sources to the Computer Input 1 through 8 15-pin HD female connectors.



NOTE: Most laptop or notebook computers have an external video port, but they require special commands to output the video to that connector. Also, the screen of a laptop shuts off once that port is activated. See the user guide for the computer for details, or contact Extron for a list of common laptop keyboard commands.

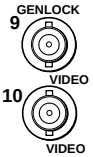
② **RGB video outputs —** Connect RGBHV video displays to the Computer Output 1 through 6 15-pin HD female connectors.



Low resolution video group

The switcher can connect to up to as many as six S-video sources, composite video sources, or both and output to as many as six video devices.

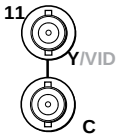
③ **Video Input 9 and Video Input 10 (composite video inputs) —** Connect composite video sources to these female BNC connectors.



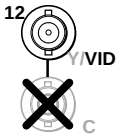
> **NOTE:** Video Input 9 serves as a timing reference for all other low resolution video group inputs. If one of the inputs is synced to a blackburst generator, connect that source to Video Input 9.

④ **Video Input 11 through Video Input 14 —**

S-video inputs — Connect an S-video source to a pair of female BNC connectors. Connect luma (Y) and chroma (C) as shown at right.



Composite video inputs — Connect a composite video source to the Video (top) connector in a pair of female BNC connectors as shown at right.

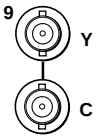


> **NOTE:** The switcher must be set to accept video inputs 11 through 14 as either S-video or composite video. Composite video is the default. See "**Selecting Composite Video or S-video**" on page 39 to change the setting.

⑤ **Composite video outputs (Video Output 7 and Video Output 8) —** Connect composite video displays to these female BNC connectors.

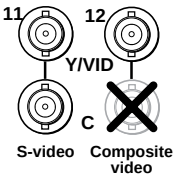
> **NOTE:** If the input tied Video Output 7 or Video Output 8 is S-video, the switcher encodes the input to composite video.
> If the tied input is composite video, the switcher passes the signal through to the output with no processing.

⑥ **S-video outputs (Video Output 9 and Video Output 10) —** Connect S-video displays to these female BNC connectors.



> **NOTE:** If the input tied Video Output 9 or Video Output 10 is composite video, the switcher decodes the input to S-video.
> If the tied input is S-video, the switcher passes the signal through to the output with no processing.

⑦ **Pass-through outputs (Video Output 11 and Video Output 12) —** Connect S-video or composite video displays to these female BNC connectors. Connect S-video Y and C or composite video as shown at right.



> **NOTE:** The switcher passes the tied input to these outputs with no signal processing; an S-video input is output as S-video, a composite video input is output as composite video.

Audio input and output

By default, the audio ties follow the video ties. Audio breakaway, which can be activated via the optional front panel or under Ethernet or RS-232 control, allows you to select from any one of the audio input sources, regardless of video group, and route it separately from its corresponding video source. See the "**Operation**" section, the "**Programming Guide**" section, the "**Matrix Software**" section, and the "**HTML Operation**" section for details.

NOTE: Audio ties can be made only to outputs in the computer/audio subgroup (outputs 1 through 6).

Audio inputs (either input subgroup)

⑧ **Connections for balanced and unbalanced audio inputs —** Each input has a 5-pole, 3.5 mm captive screw connector for balanced or unbalanced stereo or mono audio input. Connectors are included with each switcher, but you must supply the audio cable.

See figure 3 to wire a connector for the appropriate input type and impedance level. Use the supplied tie-wrap to strap the audio cable to the extended tail of the connector.

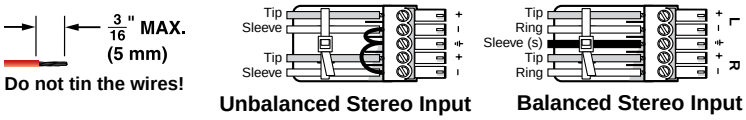


Figure 3. Captive Screw Connector Wiring for Stereo Audio Inputs

CAUTION: The captive screw audio connector can easily be inadvertently plugged partially into one receptacle and partially into an adjacent receptacle. This misconnection could damage the audio circuits. Ensure that the connector is plugged fully and only into the correct input or output.

NOTES:
- The length of exposed wires is critical. The ideal length is 3/16 inch (5 mm).
  - If the stripped section of wire is longer than 3/16 inch, the exposed wires may touch, causing a short circuit.
  - If the stripped section of wire is shorter than 3/16 inch, wires can be easily pulled out even if tightly fastened by the captive screws.
- Figure 4 identifies the tip, ring, and sleeve. A mono audio connector consists of the tip and sleeve. A stereo audio connector consists of the tip, ring and sleeve. The tip, ring, and sleeve wires are also shown on the captive screw audio connector diagrams (see figure 3, above, and **figure 5** on the next page).

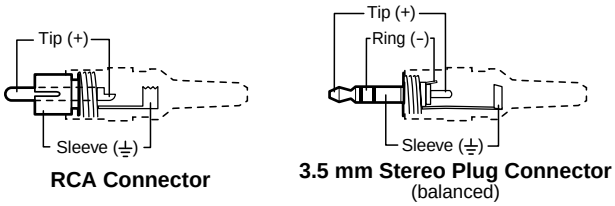


Figure 4. Typical Audio Connectors

The audio level for each input can be individually set at the front panel or via Ethernet or RS-232 control to ensure that the level on the output does not vary from input to input. See the "**Operation**" section, the "**Programming Guide**" section, the "**Matrix Software**" section, and the "**HTML Operation**" section for details.

Audio outputs (computer/audio output subgroup only)

⑨ **Connections for balanced and unbalanced audio outputs —** These 5-pole, 3.5 mm captive screw connectors output the selected, unamplified, line level audio. Connect audio devices, such as an audio amplifier or powered speakers.

See figure 5 to properly wire an output connector. Use the supplied tie-wrap to strap the audio cable to the extended tail of the connector.

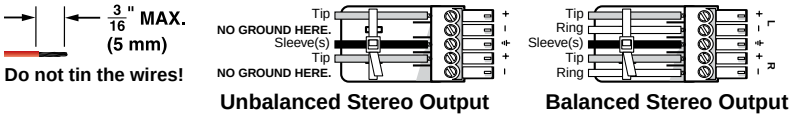


Figure 5. Captive screw connector wiring for stereo audio output

CAUTION: For unbalanced audio, connect the sleeves to the ground contact. ***DO NOT*** connect the sleeves to the negative (-) contacts.

NOTE: The length of exposed wires is critical. The ideal length is 3/16 inch (5 mm). See the audio input connector **NOTES** for more information.

The volume level for each output can be individually set via the front panel or Ethernet or RS-232 control. See the "**Operation**" section, the "**Programming Guide**" section, the "**Matrix Software**" section, and the "**HTML Operation**" section for details.

Serial Ports

⑩ **RS-232 connectors —** Connect one or two host devices, such as computers, touch panel controls, or RS-232 capable PDAs to the switcher via these 3-pole captive screw connectors for serial RS-232 (see figure 6). Use the supplied tie-wrap to strap the serial cable to the extended tail of the connector.

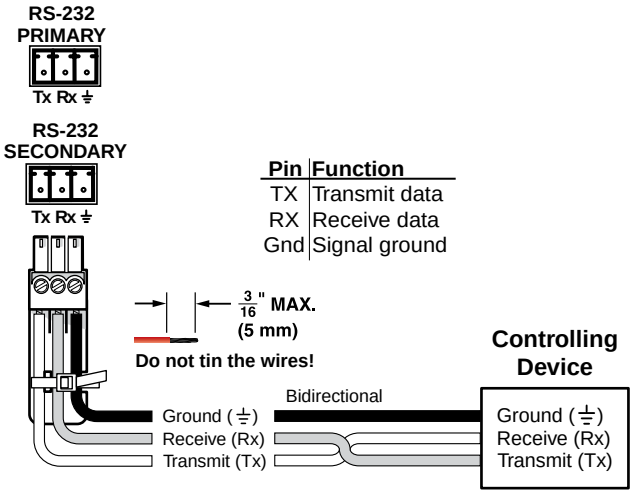


Figure 6. RS-232 connector

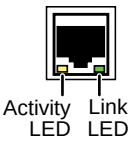
NOTES:
- The length of exposed wires is critical. The ideal length is 3/16 inch (5 mm). See the audio input connector **NOTES** for more information.
- These two ports are hardwired for RS-232 only.
- The RS-232 Secondary port is active only if the front panel Configuration port is not in use. If a front panel configuration connection is made, the rear panel RS-232 Secondary port becomes inactive and the front panel Configuration port is active.
- The switcher can operate at 9600, 19200, 38400, or 115200 baud rates. See "**Selecting the Baud Rate of the RS-232 Primary Port**" in the "Operation" section to configure the RS-232 Primary port from the front panel. See the **Set serial port parameters** SIS command to configure all ports under SIS control.

See "**Programming Guide**" for definitions of the SIS commands (serial commands to control the switcher via this connector) and "**Matrix Software**" for details on how to install and use the control software.

If desired, connect an MKP 2000 or MKP 3000 remote control panel to the RS-232 connector of the switcher. See the *MKP 2000 Remote Control Panel User Guide* or the *MKP 3000 Remote Control Panel User Guide* for details.

Ethernet Connection

⑪ **LAN port —** For IP control of the system, connect the matrix switcher to a PC or to an Ethernet LAN via this RJ-45 connector. You can use a PC to control the networked switcher with SIS commands from anywhere in the world. You can also control the switcher from a PC that is running the Extron Matrix Switchers Control Program or has downloaded HTML pages from the switcher.



Link LED indicator — The green (link) LED indicates that the switcher is properly connected to an Ethernet LAN. This LED should light steadily.

Act LED indicator — The yellow (activity) LED indicates transmission of data packets on the RJ-45 connector. This LED should flicker as the switcher communicates.

Cabling

It is vital that your Ethernet cables be the correct cable type and that they be properly terminated with the correct pinout. Ethernet links use Category (CAT) 3, 5e, or CAT 6, unshielded twisted pair (UTP) or shielded twisted pair (STP) cables, terminated with RJ-45 connectors. Ethernet cables are limited to a length of 328 feet (100 m).

NOTES:
- Do not use standard telephone cables. Telephone cables do not support Ethernet or Fast Ethernet.
- Do not stretch or bend cables. Transmission errors can occur.

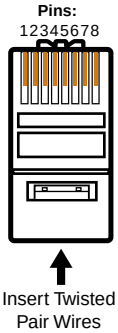
The cable used depends on your network speed. The switcher supports both 10 Mbps (10Base-T — Ethernet) and 100 Mbps (100Base-T — Fast Ethernet), half-duplex and full-duplex Ethernet connections.

- 10Base-T Ethernet requires CAT 3 UTP or STP cable at minimum.
- 100Base-T Fast Ethernet requires CAT 5e UTP or STP cable at minimum.

RJ-45 connector wiring

The Ethernet cable can be terminated as a straight-through cable or a crossover cable and must be properly terminated for your application (see figure 7).

- **Crossover cable —** Direct connection between the computer and the matrix switcher
- **Patch (straight) cable —** Connection of the matrix switcher to an Ethernet LAN



Crossover Cable

Pin	End 1 Wire color	End 2 Wire color
1	White-green	White-orange
2	Green	Orange
3	White-orange	White-green
4	Blue	Blue
5	White-blue	White-blue
6	Orange	Green
7	White-brown	White-brown
8	Brown	Brown
	T568A	T568B

A cable that is wired as T568A at one end and T568B at the other (Tx and Rx pairs reversed) is a "crossover" cable.

Straight-through Cable

Pin	End 1 Wire color	End 2 Wire color
1	White-orange	White-orange
2	Orange	Orange
3	White-green	White-green
4	Blue	Blue
5	White-blue	White-blue
6	Green	Green
7	White-brown	White-brown
8	Brown	Brown
	T568B	T568B

A cable wired the same at both ends is called a "straight-through" cable, because no pin/pair assignments are swapped.

Figure 7. RJ-45 Connector and Pinout Tables

Reset Button and LED

⑫ **Reset button —** The recessed Reset button initiates four different levels of matrix switcher reset:

- **Events (mode 3) reset —** Toggles events monitoring on and off.
- **IP settings (mode 4) reset —** Reset the IP functions of the switcher.

  NOTE: The IP settings reset does not replace any user-installed firmware.

- **Absolute (mode 5) reset —** Restore the switcher to the default factory conditions.
- **Hard reset —** Restore the switcher to the default factory conditions and return the switcher to the default firware that shipped with the unit.

  NOTES:
  - Factory loaded firmware is active until it is replaced or the power is cycled.
  - Hard reset does not clear the current configuration.

See "**Performing soft system resets**" on page 52 for details.

Power

⑬ **AC power connector —** Plug a standard IEC power cord into this connector to connect the switcher to a 100 VAC to 240 VAC, 50 or 60 Hz power source.

Front Panel Configuration Port

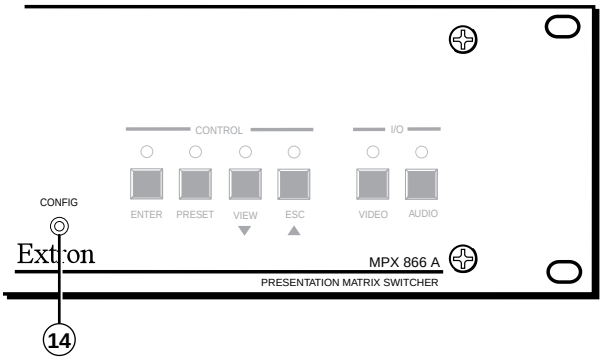
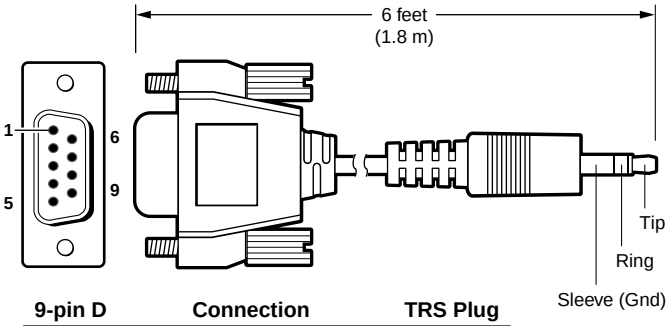


Figure 8. Front Panel Configuration Port

⑭ **Configuration port —** This 2.5 mm mini stereo jack serves the same serial communications function as the rear panel Remote port, but it is easier to access than the rear port after the matrix switcher has been installed and cabled. The optional 9-pin D to 2.5 mm mini jack TRS RS-232 cable, part number **70-335-01** (see figure 9), can be used for this connection.



9-pin D	Connection	TRS Plug
Pin 2	Computer Rx line	Tip
Pin 3	Computer Tx line	Ring
Pin 5	Computer signal ground	Sleeve

Figure 9. Optional 9-pin TRS RS-232 cable

NOTE: This port parallels the rear panel RS-232 Secondary port. If a front panel configuration connection is made, the rear panel RS-232 Secondary port becomes inactive and the front panel Configuration port is active.

This port is RS-232 only, with its default protocols as follows:

- 9600 baud
- no parity
- 8 data bits
- 1 stop bit
- no flow control

NOTES:
- The Configuration port can operate at 9600, 19200, 38400, or 115200 baud rates. See "**Selecting the Baud Rate of the RS-232 Primary Port**" in the "Operation" section to configure all ports under SIS control.
- The maximum distances from the matrix switcher to the controlling device can vary up to 200 feet (61 m). Factors such as cable gauge, baud rates, environment, and output levels (from the switcher and the controlling device) all affect transmission distance. Distances of about 50 feet (15 m) are typically not a problem. In some cases the matrix switcher may be capable of serial communications via RS-232 up to 250 feet (76 m) away.

Operation

This section describes the monitoring and operation of the MPX 866 A matrix switcher using the front panel controls and indicators, including:

- Front Panel Controls and Indicators
- Front Panel Operations
- Rear Panel Operations
- Optimizing the Audio
- Troubleshooting
- Configuration Worksheets

Front Panel Controls and Indicators

The front panel controls (see figure 10) are grouped into two sets. The input and output buttons are on the left side of the control panel. The control buttons and video/audio (I/O) selection buttons are on the right side of the panel.

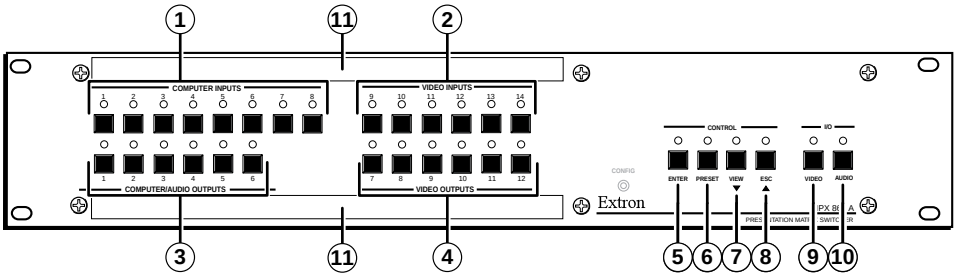


Figure 10. MPX 866 A

① **Computer input subgroup buttons and LEDs** (see page 17)

② **Video input subgroup buttons and LEDs —** (see page 17)

③ **Computer/audio output subgroup buttons and LEDs** (see page 17)

④ **Video output subgroup buttons and LEDs** (see page 17)

⑤ **Enter button and LED** (see page 19)

⑥ **Preset button and LED** (see page 19)

⑦ **View (▼) button and LED** (see page 20)

⑧ **Esc (▲) button and LED** (see page 20)

⑨ **Video button and LED** (see page 21)

⑩ **Audio button and LED** (see page 21)

⑪ **Input and output label panels** (see page 22)

Input and Output Buttons and LEDs

NOTE: See "**Front Panel Operations**," later in this chapter for detailed descriptions of all of the following functions and operations.

<table>
<tr><th colspan="3">Primary functions</th></tr>
<tr><td rowspan="2"></td><td>Action</td><td colspan="4">*Press a button*: Select an input or output for a tie being created.</td></tr>
<tr><td>Indication:</td><td colspan="4">*Blinking LED*: potential tie or untie.
Lit LED: current tie</td></tr>
<tr><td colspan="2"></td><td colspan="4">
</td></tr>
<tr><th colspan="6">Secondary functions</th></tr>
<tr><td>Presets</td><td>Action:</td><td colspan="4">Select a preset in *Preset* mode.</td></tr>
<tr><td></td><td>Indication</td><td colspan="4">*Lit*: A preset has already been saved to this location.
Blink: Preset location is selected to be saved.</td></tr>
<tr><td rowspan="2">Input configuration</td><td>Action:</td><td></td><td>*Press*: Select composite video</td><td>*Press*: Select S-video</td><td></td></tr>
<tr><td>Indication:</td><td></td><td>*Lit*: Indicate composite video</td><td>*Lit*: Indicate S-video</td><td></td></tr>
<tr><td rowspan="2">Input audio level</td><td>Action/ indication: *inputs*</td><td colspan="4">*Press a button*: Select an input for audio gain and attenuation adjustment.
Lit LED: An input is selected for audio adjustment</td></tr>
<tr><td>Indication: *outputs*</td><td colspan="4">Indicate the gain or attenuation level.</td></tr>
<tr><td rowspan="2">Output audio volume</td><td>Action/ indication: *outputs*</td><td colspan="4">*Press a button*: Select an output for volume adjustment.
Lit LED: An output is selected for audio adjustment.</td></tr>
<tr><td>Indication: *inputs*</td><td colspan="4">Indicate the output volume level.</td></tr>
<tr><td>Output mutes</td><td>Action/ Indication *outputs*</td><td colspan="4">*Press a button*: Press and hold to mute the output.
Blinking LED: Output is muted.</td></tr>
</table>

Input buttons and LEDs

① **Computer inputs 1 through 8 subgroup buttons and LEDs —** Select and identify computer video group inputs.

② **Video inputs 9 through 14 subgroup buttons and LEDs —** Select and identify low resolution video group inputs.

The video input buttons and LEDs in both groups have one primary function (❑) and two secondary (•) functions:

❑ Select and identify an input.

NOTES:
- Video outputs in the computer/audio subgroup (②) can only be tied to a computer video subgroup input (①).
- Video outputs in the low resolution video subgroup (④) can only be tied to a low resolution video subgroup input (③).
- Audio can be tied only to outputs 1 through 6. If you make a video and audio tie from the low resolution video group (inputs 9 through 14), audio is automatically redirected to tie it and output in the computer subgroup (outputs 1 through 6).
- See "**Creating a Configuration**," on page 24 to identify the outputs to which audio inputs are tied.

- Select a preset.
- Display the output volume level.

Output buttons and LEDs

③ **Computer/audio outputs 1 through 6 subgroup buttons and LEDs —** Select and identify computer video group outputs.

④ **Video outputs 7 through 12 subgroup buttons and LEDs —** Select and identify low resolution video group outputs.

The output buttons and LEDs in both groups have one primary function (❑) and three secondary (•) functions:

❑ Select and identify computer video outputs, audio output, or both.

- Mute the output.
- (**Output 7 and Output 8 buttons only**) Select and identify the video format (composite [Output 7] or S-video [Output 8]) for configurable inputs 11 through 14.
- Display the audio level of the selected input.

Control Buttons and LEDs

NOTE: See "**Front Panel Operations**," later in this chapter for detailed descriptions of all of the following functions and operations.

Primary functions					
	Action	*Press*: Save changes.	*Press*: Select *Preset* mode.	*Press*: Select *View* mode.	*Press*: Cancel/ Escape.
	Indication:	*Blink*: Save needed	*Blink*: Save preset *Lit*: Recall preset	*Blink*: *View* mode selected	Flashes once
		 ENTER	 **PRESET**	 **VIEW** ▼	 **ESC** ▲
Secondary functions					
Port configuration	Action 1:	*Press all*: Select *Serial Port Configuration* mode.			
	Action 2:	*Press*: Select 9600 baud.	*Press*: Select 19200 baud.	*Press*: Select 38400 baud.	*Press*: Select 115200 baud.
	Indication:	*Lit*: 9600 baud selected.	*Lit*: 19200 baud selected.	*Lit*: 38400 baud selected.	*Lit*: 115200 baud selected.
Front panel locks	Action:	*Press, with video and audio buttons*: Select *Lock* mode 2 or toggle between mode 0 and mode 2.			
Audio	Action:			*In* Audio *mode, press*: Decrease input level or output volume.	*In* Audio *mode, press*: Increase input level or output volume.

⑤ **Enter button and LED —** The Enter button and LED have one primary function (❑) and three secondary (•) functions:

❑ Saves configuration or preset changes that you make on the front panel and indicate that a potential change has been created but not saved. To create a simple configuration:

- Specify video, audio, or both (see I/O selection buttons and LEDs [⑨] and [⑩])
- Press the desired input button (① or ②)
- Press the desired output button(s) (③ or ④)
- Press the Enter button.

NOTES:
- Video outputs in the computer/audio subgroup (②) can only be tied to a computer video subgroup input (①).
- Video outputs in the low resolution video subgroup (④) can only be tied to a low resolution video subgroup input (③).
- Audio can be tied only to outputs 1 through 6. If you make a video and audio tie from the low resolution video group (inputs 9 through 14), audio is automatically redirected to tie it and output in the computer subgroup (outputs 1 through 6).
- See "**Creating a Configuration**," on page 24 to identify the outputs to which audio inputs are tied.

- With the Preset, View, and Esc buttons, select *Serial Port Configuration* mode.
- Select 9600 baud for the RS-232 Primary port in *Serial Port Configuration* mode and indicate its selection.
- With the Video and Audio buttons, select front panel security *Lock* mode 2 or toggle between mode 0 (unlocked) and mode 2.

⑥ **Preset button and LED —** The Preset button and LED have three primary functions (❑) and two secondary (•) functions:

❑ Activates *Save Preset* mode to save a configuration as a preset

❑ Activates *Recall Preset* mode to activate a previously-defined preset.

❑ Blinks when *Save Preset* mode is active and lights steadily when *Recall Preset* mode is active.

- With the Enter, View, and Esc buttons, select *Serial Port Configuration* mode
- Select 19200 baud for the RS-232 Primary port in *Serial Port Configuration* mode and indicate its selection.

⑦ **View (▼) button and LED —** The View (▼) button and LED have one primary function (❑) and four secondary (•) functions:

❑ Selects *View-Only* mode, which displays the current configuration, and indicates its selection.

> **NOTE:** *View-only* mode also provides a way to mute and unmute the outputs (see "**Muting and Unmuting Video and Audio Outputs**" on page 34.

- Decrease the audio level of the selected input in *Audio* mode.
- Decrease the volume of the selected output in *Audio* mode.
- With the Enter, Preset, and Esc buttons, select *Serial Port Configuration* mode.
- Select 38400 baud for the RS-232 Primary port in *Serial Port Configuration* mode and indicate its selection.

⑧ **Esc (▲) button and LED —** The Esc (▲) button and LED have one primary function (❑) and four secondary (•) functions:

❑ Cancels operations or selections in progress and resets the front panel LEDs and flashes once to indicate that the escape function has been activated.

> **NOTE:** The Esc (▲) button does not reset the current configuration, the Video button and Audio button selection, any presets, or any audio gain, attenuation, or volume settings.

- Increase the audio level of the selected input in *Audio* mode.
- Increase the volume of the selected output in *Audio* mode.
- With the Enter, Preset, and View buttons, select *Serial Port Configuration* mode.
- Select 115200 baud for the RS-232 Primary port in *Serial Port Configuration* mode and indicate its selection.

I/O Controls

NOTE: See "**Front Panel Operations**," later in this chapter for detailed descriptions of all of the following functions and operations.

You must specify video, audio, or both when you are creating or viewing a configuration. This is done with the Video button (⑨) and Audio (⑩) buttons.

Primary functions			
	Action	*Press*: Select video.	*Press*: Select audio.
	Indication:	*Lit*: Video is selected.	*Lit*: Audio is selected.
		VIDEO	**AUDIO**
Secondary functions			
Front panel locks	Action 1:	*Press together, with Enter*: Select *Lock* mode 2 or toggle between mode 0 and mode 2.	
	Action 2:	*Press together*: Select *Lock* mode 1 or toggle between mode 2 and mode 1.	
Resets	Action:	*Press together while applying power*: Perform a system reset.	
Video mode	Action:	***Hold***: Select *Video* mode.	
	Indication:	*Lit*: *Video* mode selected.	
Audio mode	Action:		***Hold***: Select *Audio* mode.
	Indication:		*Lit*: *Audio* mode selected.

⑨ **Video button and LED —** The Video button and LED have one primary function (❑) and four secondary (•) functions:

- ❑ Selects and deselects video for a configuration that is being created or viewed and lights to indicate the selection.
- • With the Enter button and Audio button, selects *Lock* mode 2 or toggles between mode 0 and mode 2.
- • With the Audio button, select *Lock* mode 1 or toggle between mode 2 and mode 1.
- • With the Audio button, commands the front panel system reset.
- • Selects the *Video* mode, in which you can define the input format for inputs 11 through 14.

⑩ **Audio button and LED —** The Audio button and LED have one primary function (❑) and four secondary (•) functions

- ❑ Selects and deselects audio for a configuration that is being created or viewed and lights to indicate the selection.
- • With the Enter button and Video button, selects *Lock* mode 2 or toggles between mode 0 and mode 2.
- • With the Video button, select *Lock* mode 1 or toggle between mode 2 and mode 1.
- • With the Video button, commands the front panel system reset.
- • Selects the *Audio* mode, in which you can adjust the input audio level and the output audio volume.

Input and Output Label Panels

⑪ **Input and output label panels —** These translucent panels can be removed and replaced to insert labels behind the panels. To remove a panel, insert the Phillips-head end of an Extron Tweeker or small Phillips-head screwdriver into the hole in one end of the panel, and gently slide the tab at the edge of the panel out of the recess in the switcher housing.

Input and output labels can be created easily with Extron button label generator software, which ships with every Extron Matrix Switcher, or with any Brother P-Touch labeler. Each input and output can be labeled with names, alphanumeric characters, or even color bitmaps for easy and intuitive input and output selection (see figure 11 and "**Button Label Generator**" in the Matrix Software section for details on using the label software.

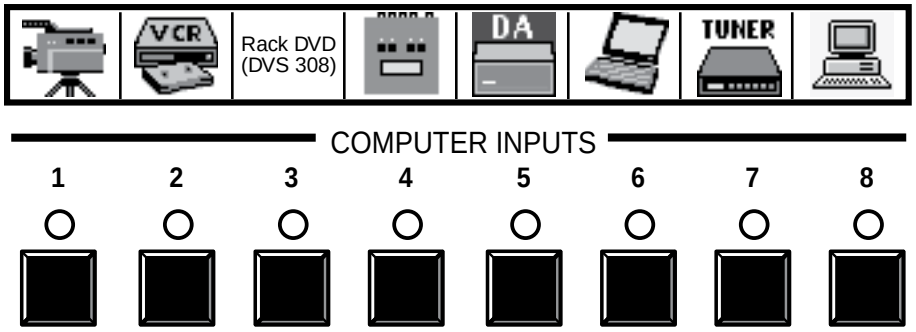


Figure 11. Sample Label

Front Panel Operations

The following paragraphs detail the power-up process and then provide sample procedures for the following actions:

- **Creating ties, sets of ties, and configurations**
- **Changing a configuration**
- **Viewing ties, sets of ties, and configurations**
- **Muting and unmuting outputs**
- **Saving a preset**
- **Recalling a preset**
- **Selecting the composite or S-video formats for inputs 11 through 14**
- **Viewing and Adjusting the Input Audio Level**
- **Viewing and Adjusting the Output Volume**
- **Setting the front panel locks**
- **Performing front panel resets**
- **Reading and setting the RS-232 Primary port settings**

Throughout this section, the following symbols are used:

○ = lit

● = unlit

● = not applicable in the example in which it appears

☼ = blinking.

Front Panel Security Lockouts

In the procedural descriptions that follow, it is assumed that the switcher is in *Lock* mode 0 (fully unlocked). The following two *Lock* modes are also available:

- *Lock* mode 1 — All changes are locked from the front panel (except for setting *Lock* mode 2). Some functions can be viewed.
- *Lock* mode 2 — Advanced features are locked and can be viewed only. Basic functions, such as tie creation, are unlocked.

NOTE: The switcher is shipped from the factory in Lock mode 2.

See "**Setting the front panel locks (Executive modes)**" on page 47 for a detailed list of basic and advanced functions and the procedures to set the various front panel locks.

Power

Apply power by connecting the power cord to an AC source. The switcher performs a self-test that flashes the front panel LEDs on and off. An error-free power up self-test sequence leaves all I/O and control LEDs unlit. The lit and unlit status of the Video LED and the Audio LED is the same as when the switcher was powered off.

The current configuration and all presets are saved in non-volatile memory. When power is applied, the most recent configuration is retrieved. The previous presets remain intact.

If an error occurs during the self-test, the switcher locks up and does not operate. If your switcher locks up on power-up, call the Extron S3 Sales & Technical Support Hotline (see the **contact numbers** on the rear of this manual for the Extron office nearest you.)

Creating a Configuration

The current configuration can be changed using the front panel buttons. Change the current configuration as follows:

1. Press the Esc button to clear any input LEDs, output LEDs, or control LEDs that may be lit.
2. Select to configure video, audio, or both by pressing the Video button and Audio button.
3. Select the desired input and outputs by pressing the input and output buttons.

   To indicate **potential ties**, output LEDs **blink** when an output is selected but not tied to the input.

   To indicate **current ties**, output LEDs **light** steadily when an input is tied to the output.

   To clear unwanted outputs, press and release the output buttons associated with the lit LEDs. To indicate **potential unties**, output LEDs **blink** when an output is deselected but not untied from the input.
4. Press and release the Enter button to accept the tie or to break an existing tie.
5. Repeat steps **1** through **4** to create additional ties until the desired configuration is complete.

NOTES:

- Video ties **cannot** be made between the computer video group and the low resolution video group.
- Audio ties can only be made to the computer video and audio subgroup (outputs 1 through 6).
- Video and audio ties between the low resolution video input subgroup and the low resolution video output subgroup are made with the audio automatically redirected. In such an operation, the switcher automatically ties the audio to an output in the computer video and audio outputs subgroup (outputs 1 through 6) as follows.

If the video is tied to output:	The audio is tied to output:
7	1
8	2
9	3
10	4
11	5
12	6

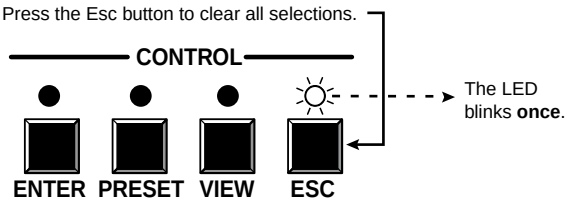
- If video is selected for configuration (the Video LED is lit) and you press the input button for an input in one group and then try to select an output in the other group, the associated output button cannot be selected. The associated input LED remains lit.
- Only one video input and one audio input can be tied to an output.
- If a tie is made in which the selected output was previously tied to another input, the older tie is broken in favor of the newer tie.
- If an input with no tie is selected, only the LED for that input lights.
- When the Video and Audio LEDs are lit, if an input with an audio tie but no video tie is selected, the LED for the input lights and the output LED and I/O Audio LEDs blink.
- As each input and output is selected, the associated output LED blinks to indicate a tentative tie. LEDs for outputs that were already tied to the input light steadily. Outputs that are already tied can be left on, along with new blinking selections, or toggled off by pressing the associated output button.

Example 1: Creating a set of computer video and audio ties

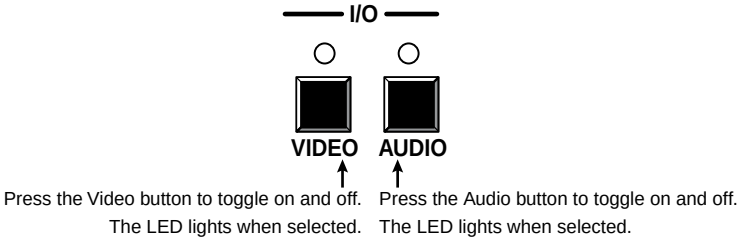
In the following example, input 5 is tied to outputs 3, 4, and 6. The steps show the front panel indications that result from your action.

NOTE: This example assumes that there are no ties in the current configuration.

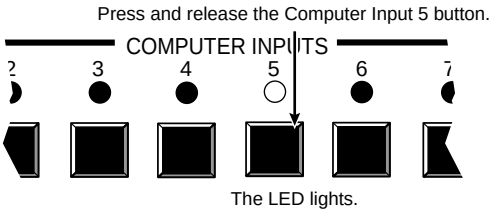
1. **Clear all selections**: Press and release the Esc button.



2. **Select video and audio for the tie**: If necessary, press and release the Video button and the Audio button until the LEDs light.

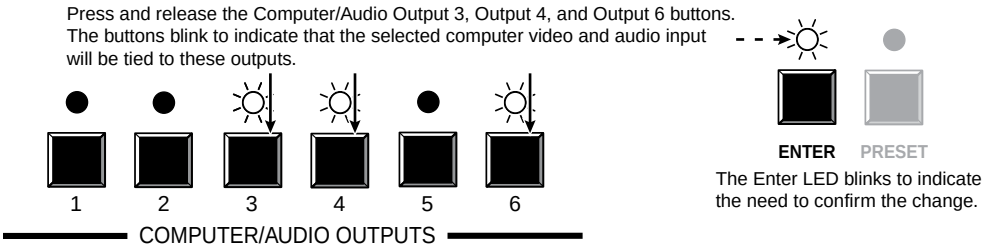

I/O
VIDEO
AUDIO
Press the Video button to toggle on and off. The LED lights when selected.
Press the Audio button to toggle on and off. The LED lights when selected.

3. **Select an input**: Press and release the input 5 button.

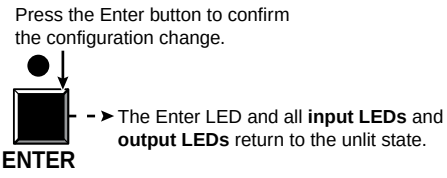


4. **Select the outputs**: Press and release the output 3, output 4, and output 6 buttons.

NOTE: The entire set of ties can be canceled at this point by pressing and releasing the Esc button. The Esc LED flashes once.


Press and release the Computer/Audio Output 3, Output 4, and Output 6 buttons. The buttons blink to indicate that the selected computer video and audio input will be tied to these outputs.
1
2
3
4
5
6
COMPUTER/AUDIO OUTPUTS
ENTER
PRESET
The Enter LED blinks to indicate the need to confirm the change.

5. **Confirm the change**: Press and release the Enter button.


Press the Enter button to confirm the configuration change.
The Enter LED and all input LEDs and output LEDs return to the unlit state.
ENTER

The current configuration is now input 5 video and audio tied to output 3, output 4, and output 6 (see figure 12).

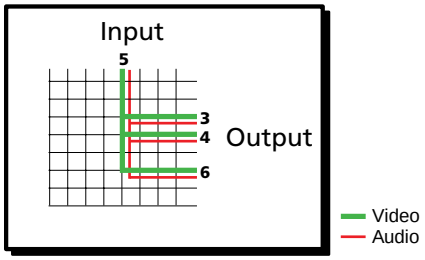


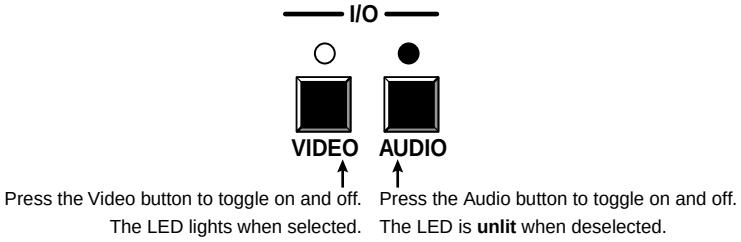
Figure 12. Example 1, final configuration

Example 2: Adding a tie to a set of computer video and audio ties

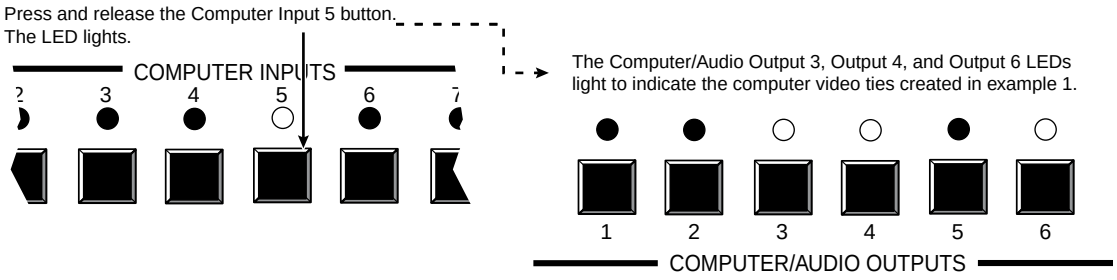
In the following example, a new video tie is added to the current configuration. The steps show the front panel indications that result from your action.

NOTE: This example assumes that you have performed **example 1**.

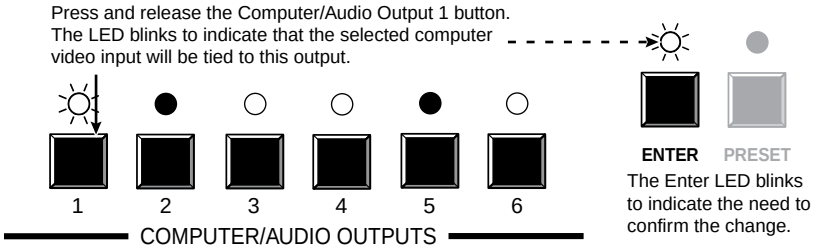
1. **Clear all selections**: Press and release the Esc button. The LED flashes once.
2. **Select video only for the tie**: If necessary, press and release the Video button and the Audio button.


I/O
VIDEO
AUDIO
Press the Video button to toggle on and off.
The LED lights when selected.
Press the Audio button to toggle on and off.
The LED is unlit when deselected.

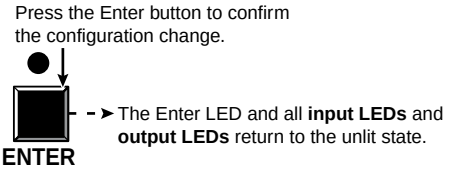
3. **Select an input**: Press and release the input 5 button.



4. **Select the output**: Press and release the output 1 button.



5. **Confirm the change**: Press and release the Enter button.


Press the Enter button to confirm
the configuration change.
ENTER
The Enter LED and all **input LEDs** and
output LEDs return to the unlit state.

The current configuration (see figure 13) is now:

- Input 5 video tied to output 1, output 3, output 4, and output 6
- Input 5 audio tied to output 3, output 4, and output 6

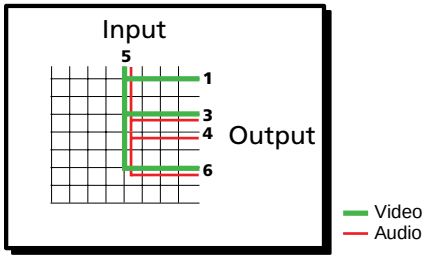


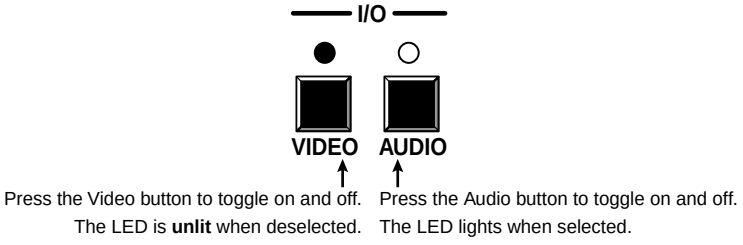
Figure 13. Example 2, final configuration

Example 3: Removing a tie from a set of computer video and audio ties

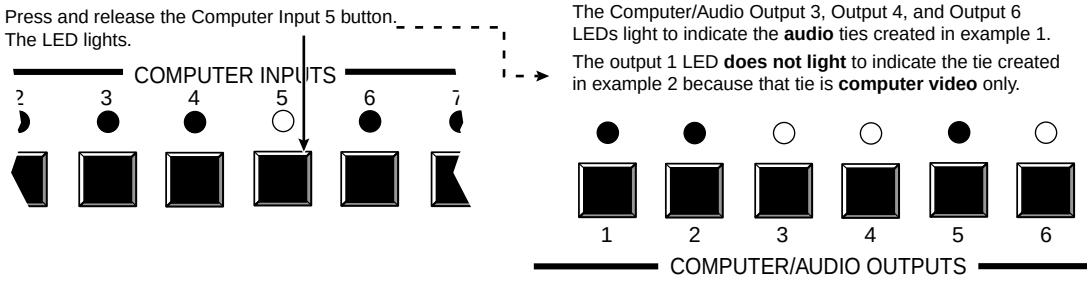
In the following example, an existing audio tie is removed from the current configuration. The steps show the front panel indications that result from your action.

NOTE: This example assumes that you have performed **example 1** and **example 2**.

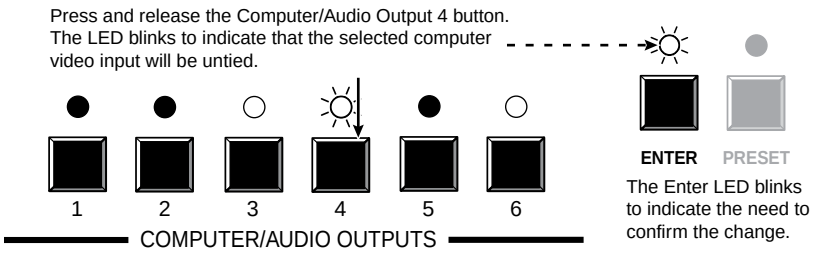
1. **Clear all selections**: Press and release the Esc button. The button flashes once.
2. **Select audio only for the tie**: If necessary, press and release the Video button and the Audio button.


I/O
VIDEO
AUDIO
Press the Video button to toggle on and off.
The LED is **unlit** when deselected.
Press the Audio button to toggle on and off.
The LED lights when selected.

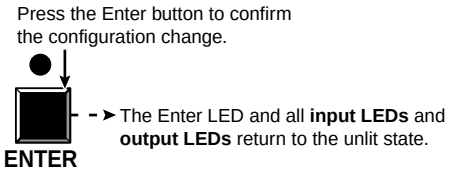
3. **Select an input**: Press and release the input 5 button.



4. **Select the output**: Press and release the output 4 button.



5. **Confirm the change**: Press and release the Enter button.


Press the Enter button to confirm the configuration change.
The Enter LED and all **input LEDs** and **output LEDs** return to the unlit state.
ENTER

The current configuration (see figure 14) is now:

- **Video —** Input 5 video tied to output 1, output 3, output 4, and output 6
- **Audio —** Input 5 audio tied to output 3 and output 6

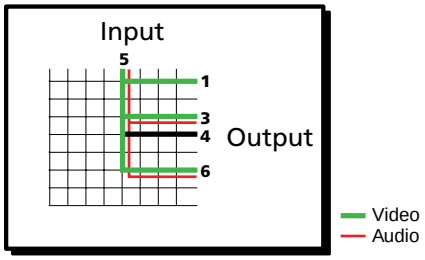


Figure 14. Example 3, final configuration, audio switcher

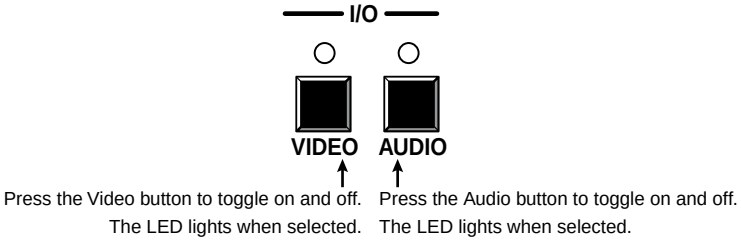
Example 4: Creating a set of low resolution video and audio ties

NOTE: This example shows the unusual indications that happen when you make video and audio ties in the low resolution video group.

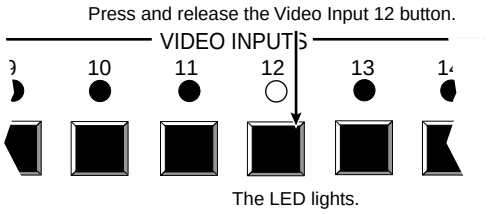
In the following example, low resolution input 12 is tied to outputs 7 and 8.
The steps show the front panel indications that result from your action.

NOTES:
- This example does **not** build on examples 1, 2, and 3. It assumes that there are no ties in the current configuration.
- When creating video and audio ties in the low resolution video group, audio must be redirected (tied to a different output than the video) because there are only audio outputs 1 through 6. In this case, the audio is tied to an output in the computer video/audio subgroup. See the **NOTE** on page 24 for redirections.

1. **Clear all selections**: Press and release the Esc button. The button flashes once.
2. **Select video and audio for the tie**: If necessary, press and release the Video button and the Audio button until the LEDs light.

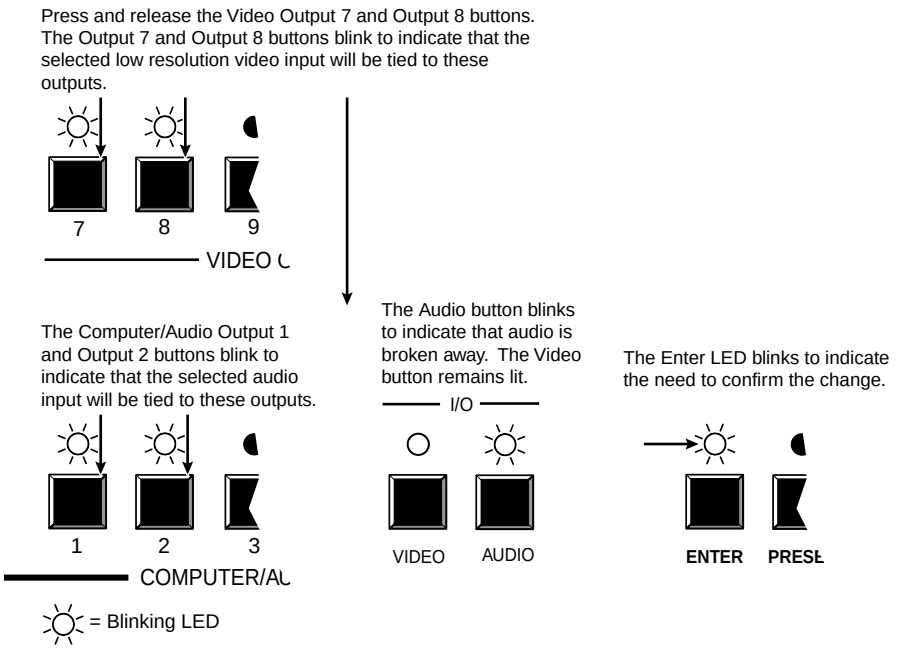

I/O
VIDEO
AUDIO
Press the Video button to toggle on and off.
The LED lights when selected.
Press the Audio button to toggle on and off.
The LED lights when selected.

3. **Select an input**: Press and release the low resolution Input 12 button.

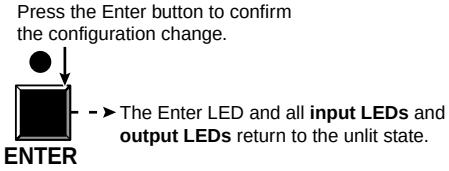


4. **Select the output**: Press and release the low resolution Output 7 and Output 8 buttons.

> **NOTE:** The entire set of ties can be canceled at this point by pressing and releasing the Esc button. The Esc LED flashes once.


Press and release the Video Output 7 and Output 8 buttons. The Output 7 and Output 8 buttons blink to indicate that the selected low resolution video input will be tied to these outputs.
7
8
9
VIDEO
The Computer/Audio Output 1 and Output 2 buttons blink to indicate that the selected audio input will be tied to these outputs.
1
2
3
COMPUTER/AU
= Blinking LED
The Audio button blinks to indicate that audio is broken away. The Video button remains lit.
I/O
VIDEO
AUDIO
The Enter LED blinks to indicate the need to confirm the change.
ENTER
PRESE

5. **Confirm the change**: Press and release the Enter button.


Press the Enter button to confirm the configuration change.
ENTER
The Enter LED and all **input LEDs** and **output LEDs** return to the unlit state.

The current configuration (see figure 15) is now:

- Input 12 video tied to output 7 and output 8
- Input 12 audio tied to output 1 and output 2

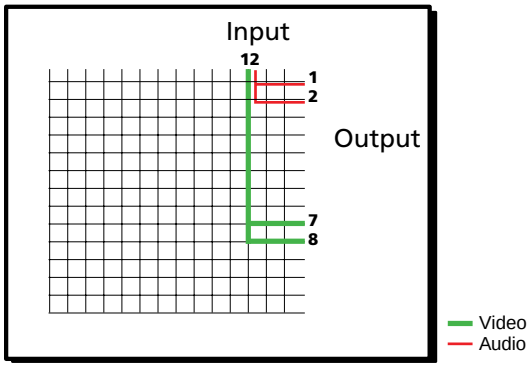


Figure 15. Example 4, final configuration

Viewing a Configuration

The current configuration can be viewed using the front panel buttons and LEDs. The *View-only* mode prevents inadvertent changes to the current configuration. *View-only* mode also provides a way to mute video and audio outputs (see "**Muting and Unmuting Video and Audio Outputs**" on page 34.

View the current configuration as follows:

1. Press the Esc button to clear any input LEDs, output LEDs, or control button LEDs that are lit.
2. Press and release the View button. All of the LEDs for outputs that are not tied light.
3. Select video, audio, or both to view by pressing the Video button and the Audio button.
4. Select the desired input or output(s) whose ties you wish to view by pressing the input and output buttons.

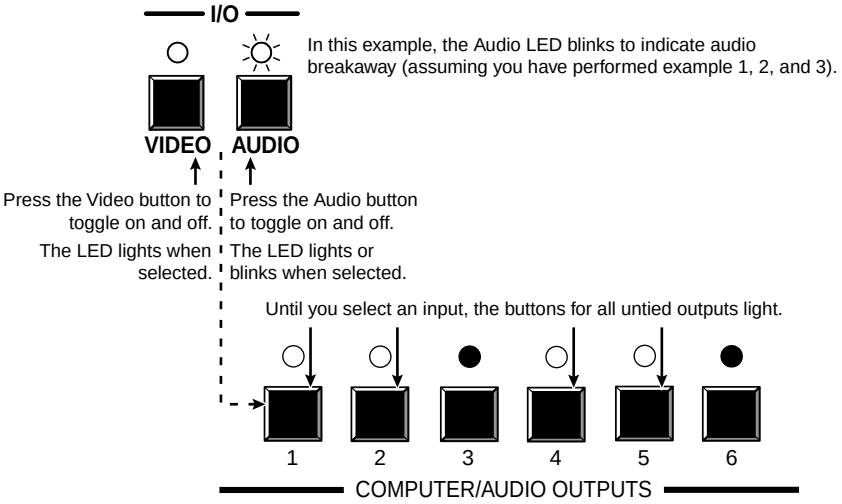
NOTES:
- When you enter *View-only* mode, the output LEDs light for all outputs **without** ties. Likewise, when an output button for which there are no ties is pushed, the output LEDs turn on for all outputs without ties.
- To see all ties of the current configuration, press and release each input and output button, one at a time, with the Video LED and the Audio LED lit.
- In *View-only* mode, you can view video and audio, video-only, or audio-only ties. Pressing and releasing the Video button and the Audio button toggles each on and off.
- After 30 seconds of inactivity, *View-only* mode automatically deselects.

Example 5: Viewing video and audio, audio only, and video only ties

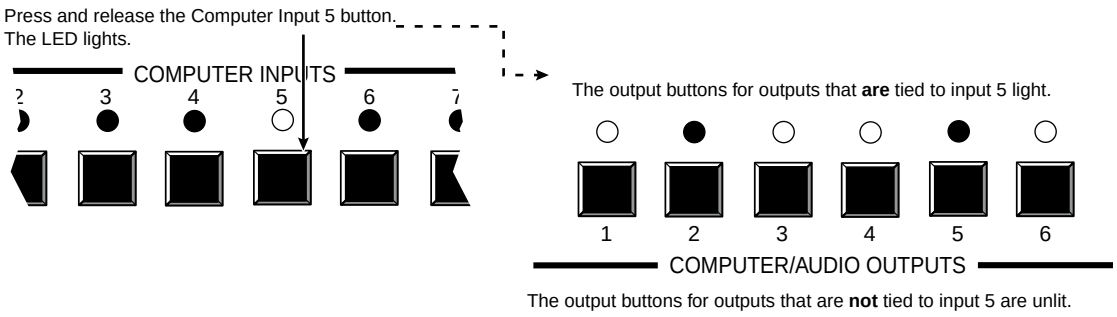
The following example shows the viewing of the video and audio, audio-only, and video-only ties in the current configuration. The steps show the front panel indications that result from your action.

NOTE: This example assumes that you have performed **example 1**, **example 2**, and **example 3**.

1. **Clear all selections**: Press and release the Esc button. The button flashes once.
2. **Select *View-only* mode**: Press and release the View button. The View button lights red.
3. **Select both video and audio for viewing**: Press and release the Video button and the Audio button.


I/O
In this example, the Audio LED blinks to indicate audio breakaway (assuming you have performed example 1, 2, and 3).
VIDEO
AUDIO
Press the Video button to toggle on and off.
The LED lights when selected.
Press the Audio button to toggle on and off.
The LED lights or blinks when selected.
Until you select an input, the buttons for all untied outputs light.
1
2
3
4
5
6
COMPUTER/AUDIO OUTPUTS

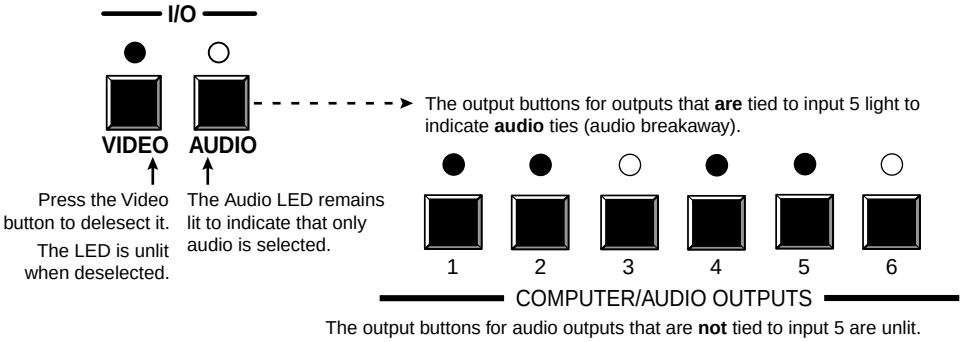
4. **Select an input**: Press and release the input 5 button.



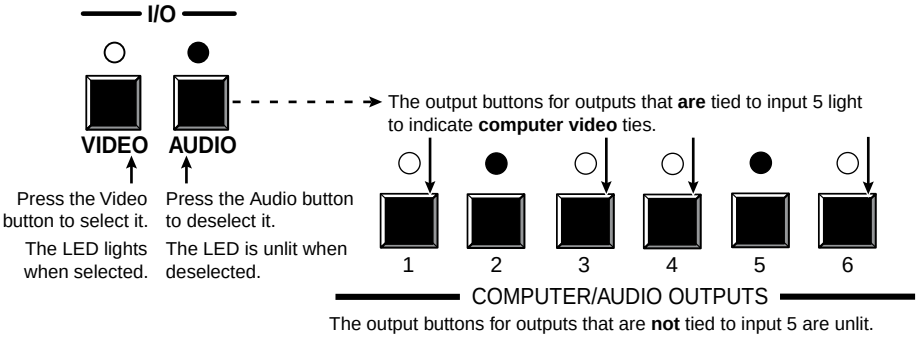
NOTE: You can also view a set of ties by selecting a tied output. Demonstrate this as follows:

1. Note the number of a lit output button, and then press and release the output button for an untied (unlit or background illumination) output.
2. Observe that all of the untied outputs light.
3. Then press the output button that you noted previously.
4. Observe that the selected output button, the tied input button (input 5), and the output buttons light for all of the outputs that are tied to the input.

5. **Deselect video**: Press and release the Video button.

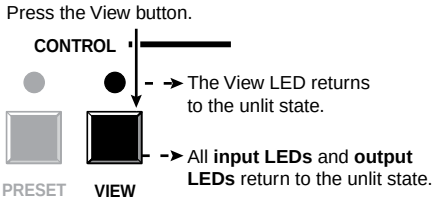

I/O
VIDEO
AUDIO
Press the Video button to delesect it.
The LED is unlit when deselected.
The Audio LED remains lit to indicate that only audio is selected.
The output buttons for outputs that are tied to input 5 light to indicate audio ties (audio breakaway).
1
2
3
4
5
6
COMPUTER/AUDIO OUTPUTS
The output buttons for audio outputs that are not tied to input 5 are unlit.

6. **Toggle the Video LED on and the Audio LED unlit**: Press and release the Video button and the Audio button.


I/O
VIDEO
AUDIO
Press the Video button to select it.
The LED lights when selected.
Press the Audio button to deselect it.
The LED is unlit when deselected.
The output buttons for outputs that are tied to input 5 light to indicate computer video ties.
1
2
3
4
5
6
COMPUTER/AUDIO OUTPUTS
The output buttons for outputs that are not tied to input 5 are unlit.

If video ties are established for input 5, the output buttons for all video outputs tied to input 5 light green. If no ties are established for input 5, all output LEDs return to unlit.

7. **Exit *View-only* mode**: Press and release the View button to exit *View-only* mode.


Press the View button.
CONTROL
The View LED returns to the unlit state.
All input LEDs and output LEDs return to the unlit state.
PRESET
VIEW

Muting and Unmuting Video and Audio Outputs

NOTE: Mutes are protected when front panel *Lock* mode 2 is selected. You can view the mute status in *Lock* mode 2 but you cannot adjust it from the front panel (see "**Setting the Front Panel Locks (Executive Modes)**" on page 47).

Individual video and outputs can be muted or unmuted as follows:

1. Press the Esc button to clear any input LEDs, output LEDs, or control LEDs that may be lit.
2. Press and release the View button.
3. Select video or audio to mute or unmute by pressing the Video button and the Audio button.
4. One at a time, press and hold the output buttons for the desired outputs for approximately 2 seconds. The output LEDs for the selected outputs blink to indicate the mute or return to their previous state to indicate the unmute.
5. Press and release the View button to return to normal switcher operation.

NOTES:

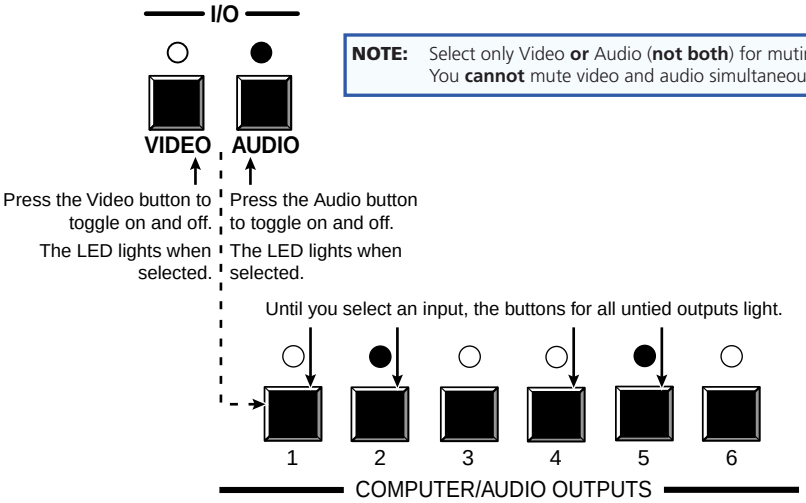
- You can mute video-only or audio-only outputs only in a single operation.
- Video and audio can both can be muted, but in separate operations; one and then the other.
- Pressing and releasing the Video button and the Audio button toggles each selection on and off.
- If you select Video and Audio in View-Only mode and then attempt to mute an output, the mute function will not work.
- When you enter View-Only mode, the output LEDs turn **on** for all outputs **without** ties.
- In the computer video group, the video mute function mutes the R, G, and B planes only; the sync (H and V planes) are still active.
- In the low resolution video group, the video mute function mutes all composite video or S-video planes.
- Mutes are saved to non-volatile memory. When power is removed and restored, the mute settings are retained.

Example 6: Muting and unmuting an output

In the following example, several switcher outputs are muted and unmuted. The steps show the front panel indications that result from your action.

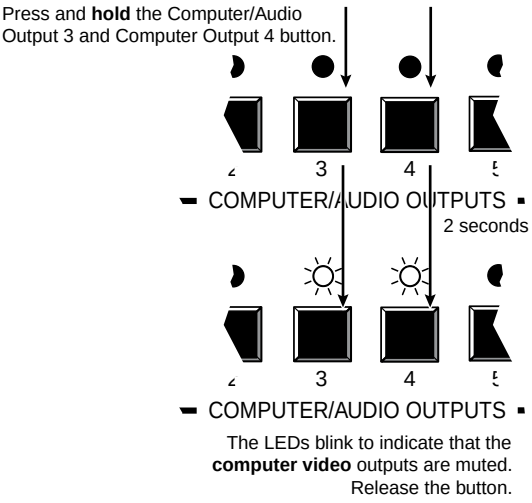
1. **Clear all selections**: Press and release the Esc button. The button flashes once.
2. **Select *View-only* mode**: Press and release the View button. The View button lights red.
3. **Select either video or audio for viewing**: Press and release the Video button and the Audio button.

> **NOTE:** This example shows the front panel indications if example 1, example 2, and example 3 have been completed.

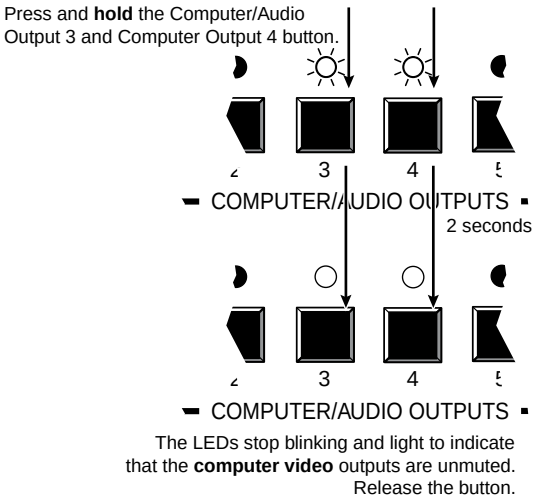

I/O
VIDEO
AUDIO
NOTE: Select only Video or Audio (not both) for muting. You cannot mute video and audio simultaneously.
Press the Video button to toggle on and off.
The LED lights when selected.
Press the Audio button to toggle on and off.
The LED lights when selected.
Until you select an input, the buttons for all untied outputs light.
1
2
3
4
5
6
COMPUTER/AUDIO OUTPUTS

> **NOTE:** Mutes are protected when front panel *Lock* mode 2 is selected. You can view the mute status in Lock mode 2 but you cannot change it from the front panel (see "**Setting the Front Panel Locks (Executive Modes)**" on page 47).
> If front panel *Lock* mode 2 is selected and you try to perform step **4**, the actions are ignored and the Enter, Video, and Audio buttons flash.

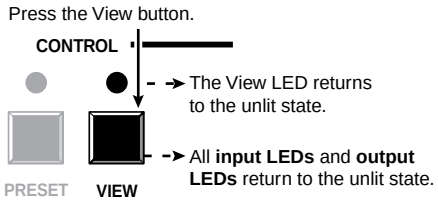
4. **Mute the outputs**: **One at a time**, press and **hold** the Output 3 button and then the Output 4 button for approximately 2 seconds until each LED begins to blink. The output 3 and output 4 signals are muted.


Press and hold the Computer/Audio Output 3 and Computer Output 4 button.
3
4
COMPUTER/AUDIO OUTPUTS
2 seconds
3
4
COMPUTER/AUDIO OUTPUTS
The LEDs blink to indicate that the computer video outputs are muted. Release the button.

5. **Unmute the outputs**: **One at a time**, press and **hold** the Output 3 button and then the Output 4 buttons for approximately 2 seconds until each LED lights steadily. The output 3 and output 4 signals are unmuted.


Press and **hold** the Computer/Audio Output 3 and Computer Output 4 button.
3
4
COMPUTER/AUDIO OUTPUTS
2 seconds
3
4
COMPUTER/AUDIO OUTPUTS
The LEDs stop blinking and light to indicate that the **computer video** outputs are unmuted. Release the button.

6. **Exit *View-only* mode**: Press and release the View button.


Press the View button.
CONTROL
The View LED returns to the unlit state.
All **input LEDs** and **output LEDs** return to the unlit state.
PRESET
VIEW

Using Global Presets

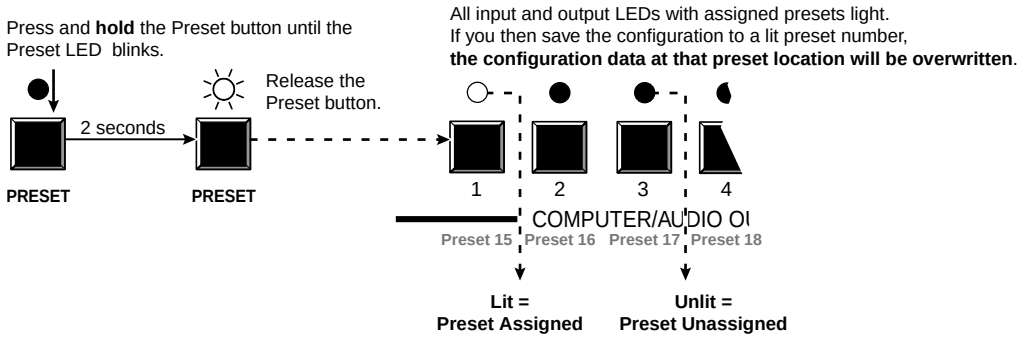
The current configuration (configuration 0) can be saved as a preset in any one of 32 global preset memory addresses. Up to 26 of those resets can be selected from the front panel to be either saved or retrieved. Global preset locations 1 through 14 are assigned to the input buttons. Global presets 15 through 26 are assigned to the output buttons. Global presets 27 through 32 are available via the RS-232 and Ethernet links only. When a **preset** is retrieved from memory, it becomes the **current configuration**.

NOTES:
- Only the audio and video ties are stored and recalled.
  - Audio gain and volume settings are not saved, and they do not change when a preset is recalled.
  - The video format (composite or S-video) for outputs 11 through 14 are not saved, and they do not change when a preset is recalled.
- Presets **cannot** be viewed from the front panel unless recalled as the current configuration. Presets **can** be viewed using the Matrix Switchers Control Program (see the "**Matrix Software**" section).
- The current configuration and all presets are stored in non-volatile memory. When power is removed and restored, the current configuration is still active and all presets are retained.
- When a preset is recalled, it replaces the current configuration, which is lost unless it is also stored as a preset. The recalled preset overwrites all of the current configuration ties in favor of the preset configuration ties.

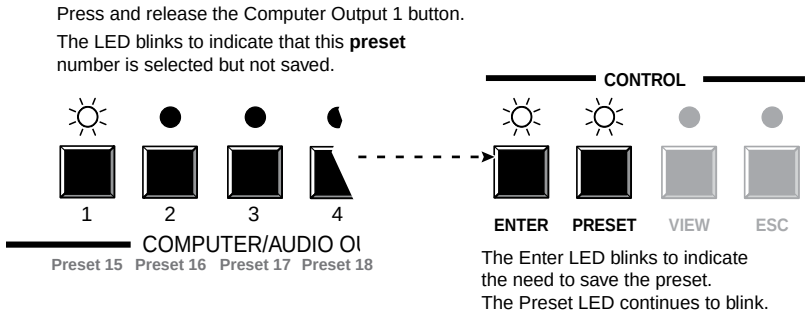
Example 7: Saving a global preset

In the following example, the current configuration is saved as a preset. The steps show the front panel indications that result from your action.

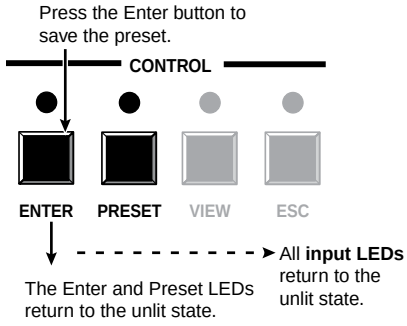
1. **Clear all selections**: Press and release the Esc button. The button flashes once.
2. **Select *Save Preset* mode**: Press and **hold** the Preset button for approximately 2 seconds until it blinks.



3. **Select the preset**: Press and release the input button for the desired preset.



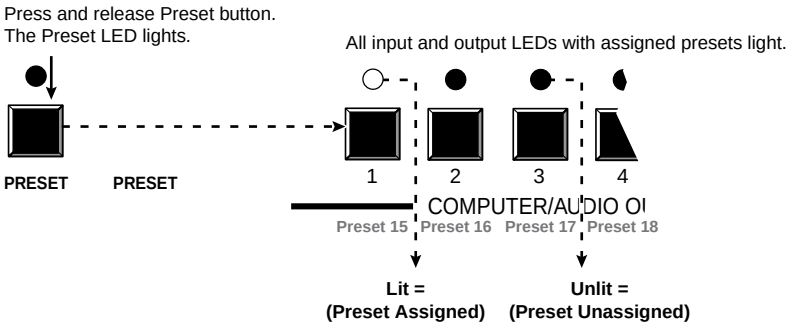
4. **Confirm the change**: Press and release the Enter button. The current configuration is now stored in the selected memory location.



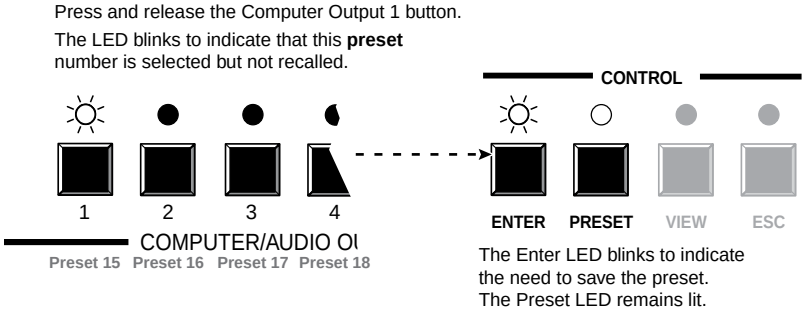
Example 8: Recalling a global preset

In the following example, a preset is recalled to become the current configuration. The steps show the front panel indications that result from your action.

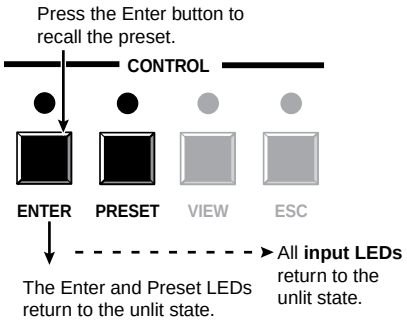
1. **Clear all selections**: Press and release the Esc button. The button flashes once.
2. **Select *Recall Preset* mode**: Press and release the Preset button.



3. **Select the preset**: Press and release the input button for the desired preset.



4. **Confirm the recall**: Press and release the Enter button. The configuration stored in the selected memory location is now the current configuration and can be viewed in the *View-only* mode (see **example 5**).



Selecting Composite Video or S-video

Low resolution video inputs 11 through 14 are individually configurable as either composite video or S-video. View and change this variable from the front panel as follows:

NOTE: Video format is protected when front panel *Lock* mode 2 is selected. You can view the format in *Lock* mode 2 but you cannot adjust it from the front panel. (see "**Setting the Front Panel Locks (Executive Modes)**" on page 47).

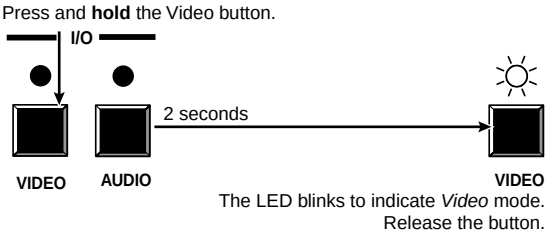
1. Press the Esc button to clear any input LEDs, output LEDs, or control LEDs that may be lit.
2. To enter *Video* mode, press and **hold** the Video button until the Video LED begins to blink, then release the button.
3. Press and release one of Video Input buttons 11 through 14 to select that input. Either Video Output LED 7 or 8 lights to indicate the video format. Video Output 7 indicates composite video and Video Output 8 indicates S-video.
4. Press and release the Video Output 7 or 8 button to select the associated video format.
5. Press and release the Video button to exit the *Video* mode. The Video LED stops blinking.

NOTES:
- Pressing the Enter or Preset button also exits *Video* mode. Pressing the Preset button changes to Recall Preset mode.
- For the switcher to recognize the change and create a new configuration map, you must create a new tie for the input whose format was changed.
- Exiting *Video* mode by pressing the Video button always returns the I/O configuration to video and audio selected for configuration.

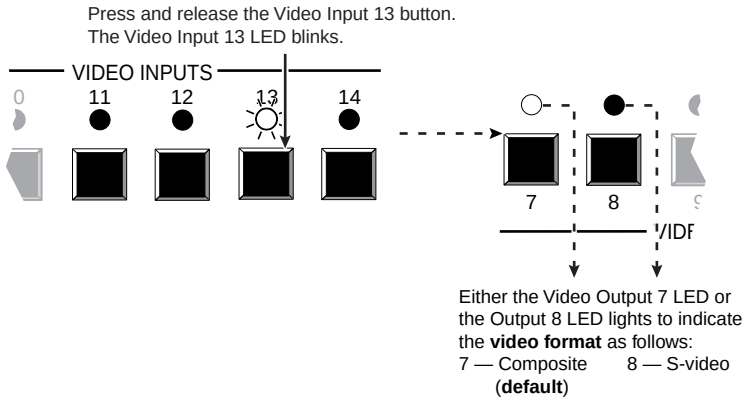
Example 9: Selecting the S-video format for an input

In the following example, the S-video format is selected for video input 12. The steps show the front panel indications that result from your action.

1. **Clear all selections**: Press and release the Esc button. The button flashes once.
2. **Enter *Video* mode**: Simultaneously press and **hold** the Video button.

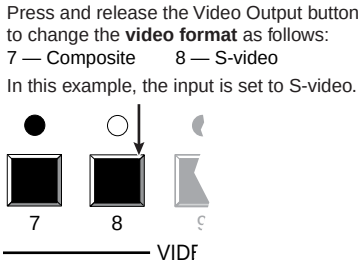


3. **Select a configurable input**: Press the Video Input button for a configurable input.


Press and release the Video Input 13 button.
The Video Input 13 LED blinks.
VIDEO INPUTS
11
12
13
14
7
8
Either the Video Output 7 LED or the Output 8 LED lights to indicate the **video format** as follows:
7 — Composite (**default**)
8 — S-video

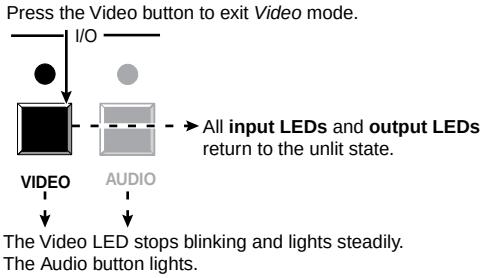
NOTE: Video format is protected when front panel *Lock* mode 2 is selected. You can view the format in Lock mode 2 but you cannot change it from the front panel (see "**Setting the Front Panel Locks (Executive Modes)**" on page 47). If front panel *Lock* mode 2 is selected and you try to perform step **4**, the actions are ignored and the Enter, Video, and Audio buttons flash.

4. Change the format: Press and release the Video Output button, 7 or 8, for the desired format.


Press and release the Video Output button
to change the **video format** as follows:
7 — Composite 8 — S-video
In this example, the input is set to S-video.
7
8
VIDF

NOTE: If desired, select another of configurable video inputs 11 through 14 to view or change the video format for that input.

5. Exit the *Video* mode: Press and release the Video button.


Press the Video button to exit *Video* mode.
I/O
All **input LEDs** and **output LEDs** return to the unlit state.
VIDEO
AUDIO
The Video LED stops blinking and lights steadily.
The Audio button lights.

NOTE: For the switcher to recognize the change and create a new configuration map, you must create a new tie for the input whose format was changed.

Viewing and Adjusting the Input Audio Level

The audio level of each input can be displayed and adjusted through a range of -18 dB to +24 dB to ensure that there is no noticeable volume difference among sources (see figure 16). The audio level can be adjusted from the front panel or under RS-232 or Ethernet control.

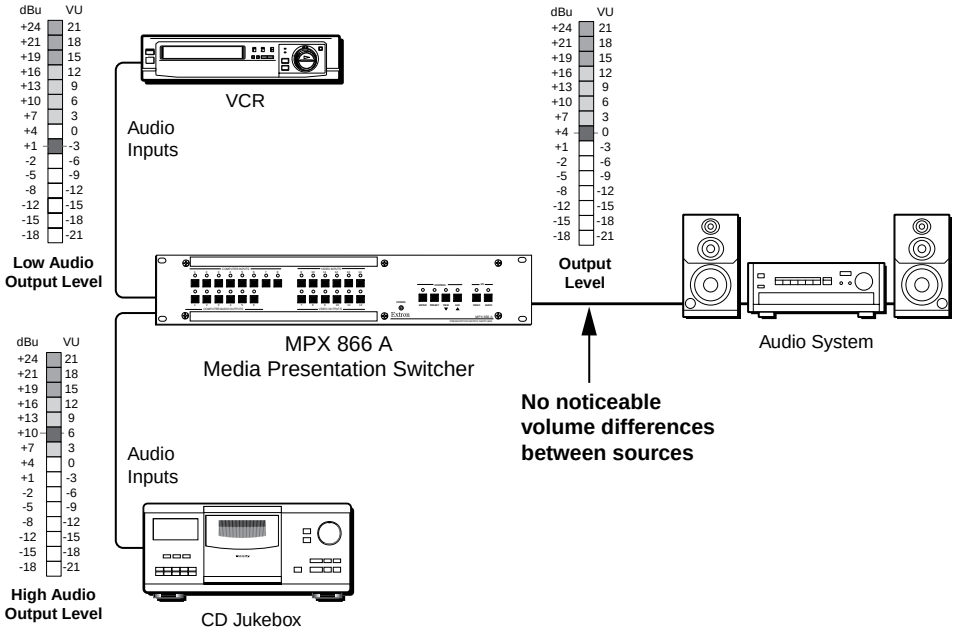


Figure 16. Audio gain and attenuation

1. Press the Esc button to clear any input LEDs, output LEDs, or control LEDs that are lit.
2. To enter *Audio* mode, press and **hold** the Audio button until the Audio LED begins to blink, then release the button.
3. Press and release an input button to select an input. The output LEDs display the audio level for the selected input. Each output LED indicates 1 dB of gain or attenuation when blinking slowly, 2 dB when blinking quickly, and 3 dB when lit steadily. The Esc (▲) and View (▼) LEDs display the polarity (gain [+] or attenuation [-]). See the table at right.
4. Press and release the Esc (▲) and View (▼) buttons to increase and decrease the audio level by 1 dB per each push of the button, or press and **hold** the button to change the level at a rate of 3 dB per second until the button is released or the upper or lower limit is reached.
5. Press and release the Audio button to exit the Audio mode. The Audio LED stops blinking.

NOTES:
- Pressing the Enter or Preset button also exits *Audio* mode. Pressing the Preset button changes to Recall Preset mode.
- There is one audio level setting per input. The audio level setting is shared by the left and right audio inputs.
- The audio level settings are stored in non-volatile memory. When power is removed and restored, the audio level settings are retained.
- Exiting Audio mode by pressing the Audio button always returns the I/O LEDs to Video and Audio lit (video and audio selected for configuration).

Input Audio Level Adjustment Displays

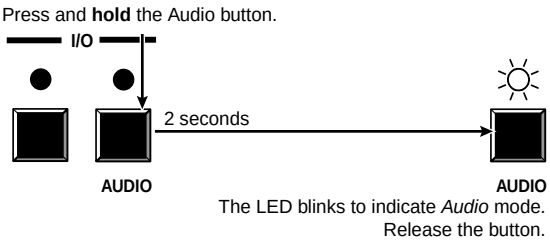
dB	Output LED 1	2	3	4	5	6	7	8	View ▼	Esc ▲	dB
+24	○	○	○	○	○	○	○	○	●	○	+24
+23	○	○	○	○	○	○	○	Ⓕ	●	○	+23
+22	○	○	○	○	○	○	○	Ⓢ	●	○	+22
+21	○	○	○	○	○	○	○	●	●	○	+21
+20	○	○	○	○	○	○	Ⓕ	●	●	○	+20
+19	○	○	○	○	○	○	Ⓢ	●	●	○	+19
+18	○	○	○	○	○	○	●	●	●	○	+18
+17	○	○	○	○	○	Ⓕ	●	●	●	○	+17
+16	○	○	○	○	○	Ⓢ	●	●	●	○	+16
+15	○	○	○	○	○	●	●	●	●	○	+15
+14	○	○	○	○	Ⓕ	●	●	●	●	○	+14
+13	○	○	○	○	Ⓢ	●	●	●	●	○	+13
+12	○	○	○	○	●	●	●	●	●	○	+12
+11	○	○	○	Ⓕ	●	●	●	●	●	○	+11
+10	○	○	○	Ⓢ	●	●	●	●	●	○	+10
+9	○	○	○	●	●	●	●	●	●	○	+9
+8	○	○	Ⓕ	●	●	●	●	●	●	○	+8
+7	○	○	Ⓢ	●	●	●	●	●	●	○	+7
+6	○	○	●	●	●	●	●	●	●	○	+6
+5	○	Ⓕ	●	●	●	●	●	●	●	○	+5
+4	○	Ⓢ	●	●	●	●	●	●	●	○	+4
+3	○	●	●	●	●	●	●	●	●	○	+3
+2	Ⓕ	●	●	●	●	●	●	●	●	○	+2
+1	Ⓢ	●	●	●	●	●	●	●	●	○	+1
0	●	●	●	●	●	●	●	●	●	○	0
-1	Ⓢ	●	●	●	●	●	●	●	○	●	-1
-2	Ⓕ	●	●	●	●	●	●	●	○	●	-2
-3	○	●	●	●	●	●	●	●	○	●	-3
-4	○	Ⓢ	●	●	●	●	●	●	○	●	-4
-5	○	Ⓕ	●	●	●	●	●	●	○	●	-5
-6	○	○	●	●	●	●	●	●	○	●	-6
-7	○	○	Ⓢ	●	●	●	●	●	○	●	-7
-8	○	○	Ⓕ	●	●	●	●	●	○	●	-8
-9	○	○	○	●	●	●	●	●	○	●	-9
-10	○	○	○	Ⓢ	●	●	●	●	○	●	-10
-11	○	○	○	Ⓕ	●	●	●	●	○	●	-11
-12	○	○	○	○	●	●	●	●	○	●	-12
-13	○	○	○	○	Ⓢ	●	●	●	○	●	-13
-14	○	○	○	○	Ⓕ	●	●	●	○	●	-14
-15	○	○	○	○	○	●	●	●	○	●	-15
-16	○	○	○	○	○	Ⓢ	●	●	○	●	-16
-17	○	○	○	○	○	Ⓕ	●	●	○	●	-17
-18	○	○	○	○	○	○	●	●	○	●	-18
	1	2	3	4	5	6	7	8			

○ = on, Ⓕ = blinking fast, Ⓢ = blinking slowly, ● = off

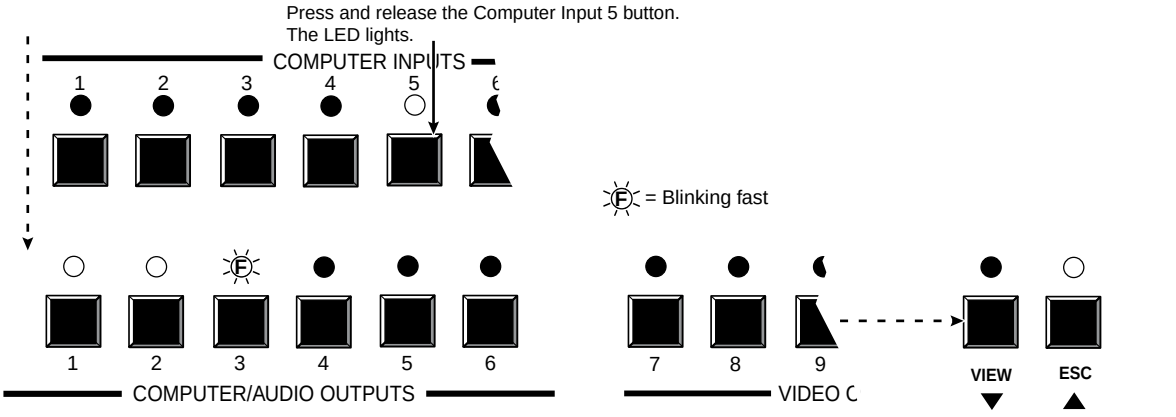
Example 10: Viewing and adjusting an input audio level

In the following example, an audio level is viewed and adjusted. The steps show the front panel indications that result from your action.

1. **Clear all selections**: Press and release the Esc button. The button flashes once.
2. **Enter *Audio* mode**: Simultaneously press and **hold** the Audio button.



3. **Select an input**: Press and release the input 5 button.


Press and release the Computer Input 5 button.
The LED lights.
COMPUTER INPUTS
1 2 3 4 5
= Blinking fast
1 2 3 4 5 6
COMPUTER/AUDIO OUTPUTS
7 8 9
VIDEO C
VIEW
ESC
The output LEDs, independent of video group, display the audio level of the selected input.
The View and Esc LEDs display the polarity (gain or attenuation).
In this example, the output buttons and View and Esc buttons display an audio gain level of +8 dB.

4. **Adjust the audio level**: Press and release the View (▼) button once (see figure 17) to decrease the input audio level by 1 dB.

   Press and release the View (▼) button several more times (see figure 17) to decrease the input audio level by 1 dB per push of the button. Note the output button indication changes that occur each time the View (▼) button is pressed.

   Figure 17 shows the result of pressing the View (▼) button a total of 9 times.

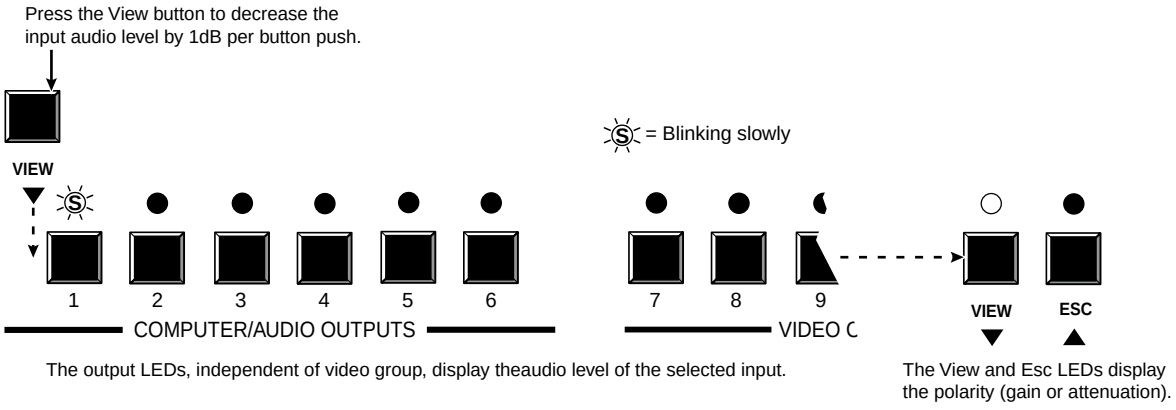
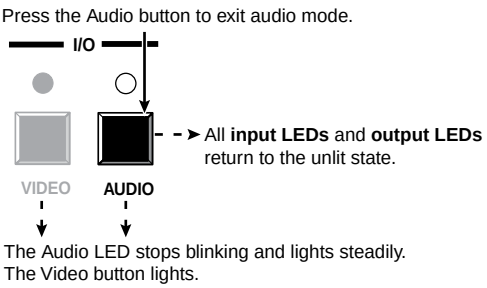

Press the View button to decrease the input audio level by 1dB per button push.
VIEW
= Blinking slowly
1 2 3 4 5 6
COMPUTER/AUDIO OUTPUTS
7 8 9
VIDEO C
VIEW
ESC
The output LEDs, independent of video group, display theaudio level of the selected input.
The View and Esc LEDs display the polarity (gain or attenuation).
In this example, the output buttons and View and Esc buttons display an audio gain level of -1 dB.

Figure 17. Adjust the Input Audio Level

5. **Exit the *Audio* mode**: Press and release the Audio button.


Press the Audio button to exit audio mode.
I/O
All input LEDs and output LEDs return to the unlit state.
VIDEO
AUDIO
The Audio LED stops blinking and lights steadily.
The Video button lights.

Viewing and Adjusting the Output Volume

The audio level of each output can be displayed and adjusted through a range of 100% (no attenuation) to 0% (maximum [76 dB] attenuation). The audio level can be adjusted from the front panel or under RS-232 or Ethernet control.

NOTE: Output volume is protected when front panel *Lock* mode 2 is selected. You can view the volume in *Lock* mode 2 but you cannot adjust it from the front panel (see "**Setting the Front Panel Locks (Executive Modes)**" on page 47).

1. Press the Esc button to clear any input LEDs, output LEDs, or control LEDs that may be lit.
2. To enter *Audio* mode, press and **hold** the Audio button until the LED begins to blink, then release the button.
3. Press and release an output button to select an output. The input LEDs display the volume level for the selected output. The more buttons that are lit, the higher the volume. The fewer buttons that are lit, the lower the volume.

   For a more detailed analysis of decoding the displayed value, see "**Reading the displayed volume**," below.
4. Press and release the View (▼) and Esc (▲) buttons to increase and decrease the audio volume.
5. Press and release the Audio button to save the audio settings and exit the *Audio* mode. The Audio LED stops blinking.

NOTES:
- There is one audio volume level setting per output. The audio level setting is shared by the left and right audio inputs.
- The audio volume levels are stored in non-volatile memory. When power is removed and restored, the audio level settings are retained.
- Exiting Audio mode by pressing the Audio button always returns the I/O LEDs to the Video and Audio lit (video and audio selected for configuration).
- Pressing the Enter or Preset button also exits *Audio* mode. Pressing the Preset button changes to *Recall Preset* mode.

Reading the displayed volume

TIP: Skip this section if you do not need to read the exact value of the volume setting.

There are 65 steps of volume attenuation, with 1 dB per step (button push), except for 0-to-1, which is 13 dB. At maximum attenuation, no input LEDs are lit, 76 dB of attenuation is applied, and the audio is effectively muted. At no attenuation, all input LEDs are lit and the output volume is equal to the input signal plus any applied gain or attenuation using the input audio level adjustment (see "**Viewing and Adjusting the Input Audio Level**").

See the table at right to read the volume display.

The input LEDs light sequentially to indicate the approximate volume of the selected output. Volume is defined as a percentage of the input audio signal that is applied to the output. From 0% of volume, the first Esc (▲) button push applies 5.5% of the input audio signal and the Input 1 LED begins to blink slowly. From 5.5% on, each Esc (▲) push applies 1.5% more of the input audio signal to the output:

- **Push Esc (▲) button —** 5.5% + 1.5% = 7% volume, indicated by the Input 1 LED continuing to blink slowly.
- **Push Esc (▲) button twice —** 7% + 1.5% + 1.5% = 10% volume, indicated by the Input 1 LED blinking fast.
- **Push Esc (▲) button 19 times —** 10% + (19 times 1.5%) = 38.5% volume, indicated by the Input 1 through Input 4 LEDs lit steadily.

When all input LEDs are lit, the audio output is 100% of the audio input level.

Another way to think of the volume level is in terms of the attenuation applied to the output. Attenuation reduction is indicated by the lit or blinking input LEDs: when fewer input LEDs are lit, attenuation is greater (and the volume is decreased).

- At minimum volume, all input LEDs are unlit and 76 dB of attenuation is applied to the output. The audio output is effectively muted.
- The first step of volume increase causes the Input 1 button to blink slowly. Attenuation is reduced by 13 dB (63 dB of attenuation is applied to the output).
- The second step of volume increase reduces the attenuation by an additional 1 dB (62 dB of attenuation is applied to the output).
- Successive steps of volume increase cause consecutive LEDs to blink slowly, blink quickly, and then light steadily.
- At full volume, no attenuation is applied to the output and all input LEDs are lit steadily.

Audio Output Volume Settings

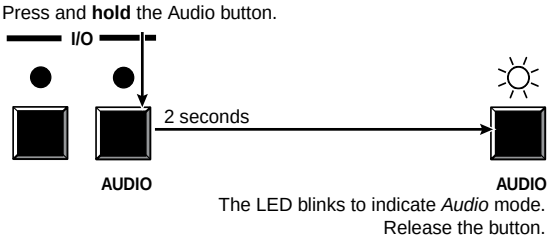
Output volume	dB of attenuation	Input LED 1	2	3	4	5	6	7	8	9	10	11	12
0%	76	●	●	●	●	●	●	●	●	●	●	●	●
5.5%	63	Ⓢ	●	●	●	●	●	●	●	●	●	●	●
7%	62												
8.5%	61	Ⓕ	●	●	●	●	●	●	●	●	●	●	●
10%	60												
11.5%	59	○	●	●	●	●	●	●	●	●	●	●	●
13%	58	○	Ⓢ	●	●	●	●	●	●	●	●	●	●
14.5%	57												
16%	56	○	Ⓕ	●	●	●	●	●	●	●	●	●	●
17.5%	55												
19%	54												
20.5%	53	○	○	●	●	●	●	●	●	●	●	●	●
22%	52	○	○	Ⓢ	●	●	●	●	●	●	●	●	●
23.5%	51												
25%	50	○	○	Ⓕ	●	●	●	●	●	●	●	●	●
26.5%	49												
28%	48												
29.5%	47	○	○	○	●	●	●	●	●	●	●	●	●
31%	46	○	○	○	Ⓢ	●	●	●	●	●	●	●	●
32.5%	45												
34%	44	○	○	○	Ⓕ	●	●	●	●	●	●	●	●
35.5%	43												
37%	42												
38.5%	41	○	○	○	○	●	●	●	●	●	●	●	●
40%	40	○	○	○	○	Ⓢ	●	●	●	●	●	●	●
41.5%	39												
43%	38	○	○	○	○	Ⓕ	●	●	●	●	●	●	●
44.5%	37												
46%	36												
47.5%	35	○	○	○	○	○	●	●	●	●	●	●	●
49%	34	○	○	○	○	○	Ⓢ	●	●	●	●	●	●
50.5%	33												
52%	32	○	○	○	○	○	Ⓕ	●	●	●	●	●	●
53.5%	31												
55%	30	○	○	○	○	○	○	●	●	●	●	●	●
56.5%	29	○	○	○	○	○	○	Ⓢ	●	●	●	●	●
58%	28												
59.5%	27	○	○	○	○	○	○	Ⓕ	●	●	●	●	●
61%	26												
62.5%	25	○	○	○	○	○	○	○	●	●	●	●	●
64%	24	○	○	○	○	○	○	○	Ⓢ	●	●	●	●
65.5%	23												
67%	22	○	○	○	○	○	○	○	Ⓕ	●	●	●	●
68.5%	21												
70%	20	○	○	○	○	○	○	○	○	●	●	●	●
71.5%	19	○	○	○	○	○	○	○	○	Ⓢ	●	●	●
73%	18												
74.5%	17	○	○	○	○	○	○	○	○	Ⓕ	●	●	●
76%	16												
77.5%	15	○	○	○	○	○	○	○	○	○	●	●	●
79%	14	○	○	○	○	○	○	○	○	○	Ⓢ	●	●
80.5%	13												
82%	12	○	○	○	○	○	○	○	○	○	Ⓕ	●	●
83.5%	11												
85%	10	○	○	○	○	○	○	○	○	○	○	●	●
86.5%	9	○	○	○	○	○	○	○	○	○	○	Ⓢ	●
86%	8												
89.5%	7	○	○	○	○	○	○	○	○	○	○	Ⓕ	●
91%	6												
92.5%	5	○	○	○	○	○	○	○	○	○	○	○	●
94%	4	○	○	○	○	○	○	○	○	○	○	○	Ⓢ
95.5%	3												
97%	2	○	○	○	○	○	○	○	○	○	○	○	Ⓕ
98.5%	1												
100%	0	○	○	○	○	○	○	○	○	○	○	○	○
		1	2	3	4	5	6	7	8	9	10	11	12

○ = on, Ⓕ = blinking fast, Ⓢ = blinking slowly, ● = off

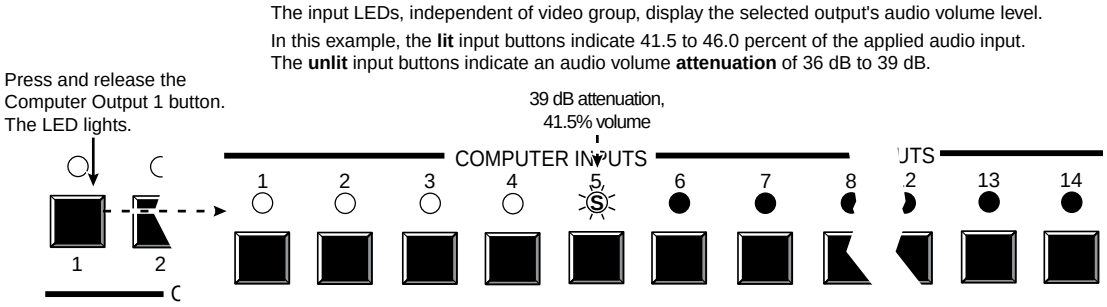
Example 11: Viewing and adjusting an output volume level

In the following example, the audio output volume is viewed and adjusted. The steps show the front panel indications that result from your actions. **See the table** on page 45 to read the volume display.

1. **Clear all selections**: Press and release the Esc button. The button flashes once.
2. **Enter *Audio* mode**: Simultaneously press and **hold** the Audio button.



3. **Select an output**: Press and release the output 1 button.


The input LEDs, independent of video group, display the selected output's audio volume level.
In this example, the **lit** input buttons indicate 41.5 to 46.0 percent of the applied audio input.
The **unlit** input buttons indicate an audio volume **attenuation** of 36 dB to 39 dB.
Press and release the Computer Output 1 button. The LED lights.
39 dB attenuation, 41.5% volume
COMPUTER INPUTS
1 2 3 4 5 6 7 8 2 13 14
1 2

> **NOTE:** Volume is protected when front panel *Lock* mode 2 is selected. You can view the volume in Lock mode 2 but you cannot change it from the front panel (see "**Setting the Front Panel Locks (Executive Modes)**" on page 47).
> If front panel *Lock* mode 2 is selected and you try to perform step **4**, the actions are ignored and the Enter, Video, and Audio buttons flash.

4. **Adjust the volume**: Press and release the Esc (▲) button once (see **figure 18** on the next page) to increase the volume by 1.5%.

   Press and release the Esc (▲) button several more times to increase the volume by 1.5% per push of the button. Note the input LED indication changes that occur each time the Esc (▲) button is pressed and released.

> **NOTE:** You can press and hold the Esc (▲) or View (▼) button to ramp the level up or down by 3 dB per second to the high or low limit.

Figure 18 show the result of pressing the Esc (▲) button a total of 13 times.

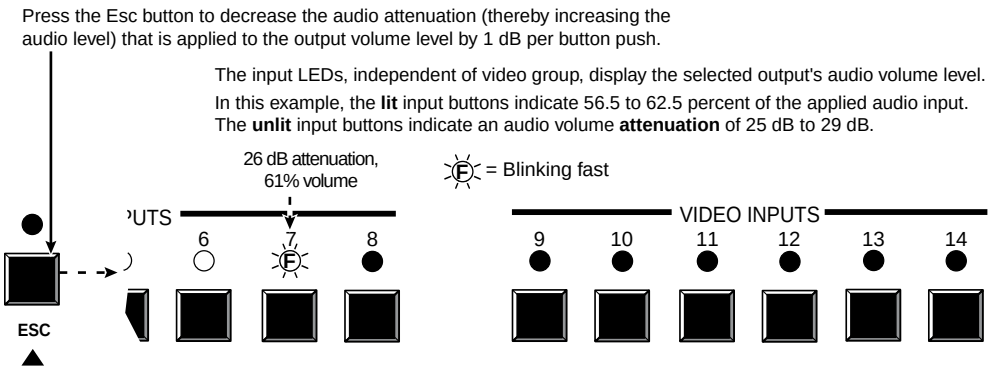
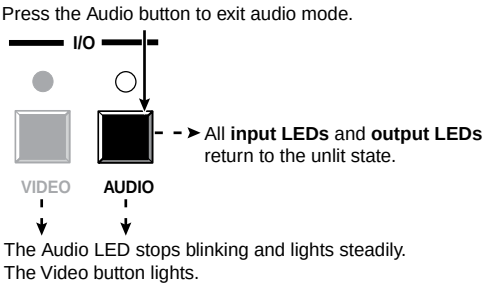

Press the Esc button to decrease the audio attenuation (thereby increasing the audio level) that is applied to the output volume level by 1 dB per button push.
The input LEDs, independent of video group, display the selected output's audio volume level.
In this example, the lit input buttons indicate 56.5 to 62.5 percent of the applied audio input.
The unlit input buttons indicate an audio volume attenuation of 25 dB to 29 dB.
26 dB attenuation, 61% volume
= Blinking fast
VIDEO INPUTS
6
7
8
9
10
11
12
13
14
ESC

Figure 18. Adjust the Output Audio Volume

5. **Exit the *Audio* mode**: Press and release the Audio button.


Press the Audio button to exit audio mode.
I/O
All input LEDs and output LEDs return to the unlit state.
VIDEO
AUDIO
The Audio LED stops blinking and lights steadily.
The Video button lights.

Setting the Front Panel Locks (*Executive* Modes)

The matrix switcher has three levels of front panel security lock that limit the operation of the switcher from the front panel. The three levels are:

- ***Lock* mode 0 —** The front panel is completely unlocked (all functions are available).
- ***Lock* mode 1 —** All changes are locked from the front panel (except for setting *Lock* mode 2). Some functions can be viewed.
- ***Lock* mode 2 —** Basic functions are unlocked. Advanced features are locked and can be viewed only.

Basic features consist of:

- Making ties
- Saving and recalling presets
- Setting input audio gain and attenuation
- Changing *Lock* modes

Advanced features consist of:

- Selecting S-video or composite video
- Setting video and audio output mutes
- Setting audio output volume
- Setting the rear panel remote port baud rate

NOTE: The switcher is shipped from the factory in *Lock* mode 2.

Selecting *Lock* mode 2 or toggling between mode 2 and mode 0

NOTES:
- If the switcher is in *Lock* mode 0 or mode 1, this procedure selects mode 2.
- If the switcher is in *Lock* mode 2, this procedure selects mode 0 (unlocks the switcher).

To toggle the lock on and off, press and hold the Enter button, the Video button, and the Audio button for approximately 2 seconds (see figure 19).

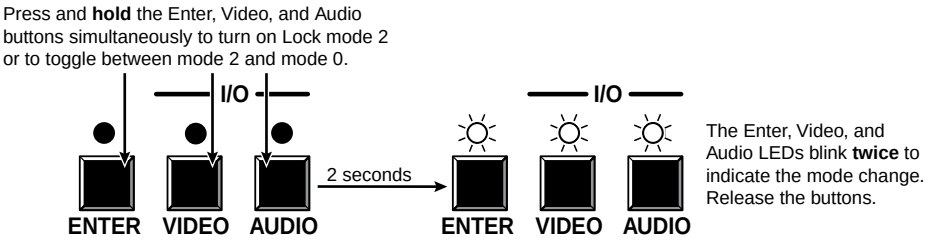

Press and **hold** the Enter, Video, and Audio buttons simultaneously to turn on Lock mode 2 or to toggle between mode 2 and mode 0.
I/O
2 seconds
I/O
The Enter, Video, and Audio LEDs blink **twice** to indicate the mode change. Release the buttons.
ENTER
VIDEO
AUDIO
ENTER
VIDEO
AUDIO

Figure 19. Toggle Front Panel Lock Between Mode 2 and Mode 0

Selecting *Lock* mode 2 or toggling between mode 2 and mode 1

NOTES:
- If the switcher is in *Lock* mode 0 or mode 1, this procedure selects mode 2.
- If the switcher is in *Lock* mode 2, this procedure selects mode 1.

To toggle the lock on and off, press and hold the Video button and the Audio button for approximately 2 seconds (see figure 20).

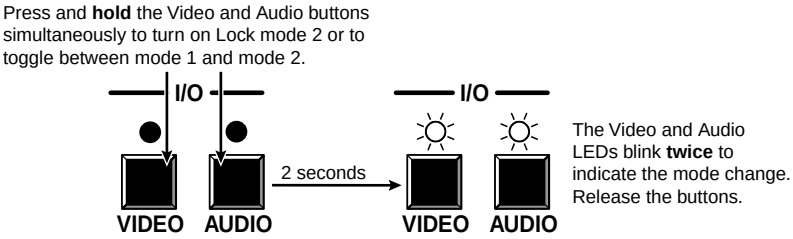

Press and **hold** the Video and Audio buttons simultaneously to turn on Lock mode 2 or to toggle between mode 1 and mode 2.
I/O
2 seconds
I/O
The Video and Audio LEDs blink **twice** to indicate the mode change. Release the buttons.
VIDEO
AUDIO
VIDEO
AUDIO

Figure 20. Toggle Front Panel Lock Between Mode 2 and Mode 1

Performing a System Reset from the Front Panel

The front panel reset is identical to the Esc ZXXX ← SIS command described in the Programming Guide section. A system reset:

- Clears all ties and presets
- Clears all video and audio mutes
- Sets all input audio levels to unity gain (+0 dB)
- Sets all output volume levels to 100% (0 dB of attenuation).

Reset the switcher to the factory default settings by pressing and **holding** the Video button and Audio button **while** you apply AC power to the switcher (see figure 21).

NOTE: System reset does not reset the Internet protocol (IP) settings or replace user-installed firmware.

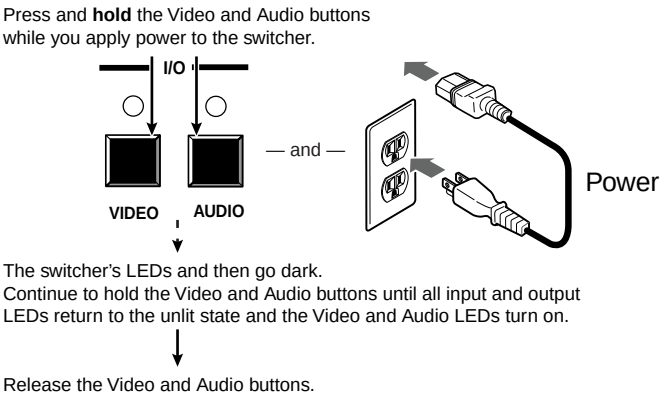

Press and **hold** the Video and Audio buttons while you apply power to the switcher.
I/O
VIDEO
AUDIO
— and —
Power
The switcher's LEDs and then go dark.
Continue to hold the Video and Audio buttons until all input and output LEDs return to the unlit state and the Video and Audio LEDs turn on.
Release the Video and Audio buttons.

Figure 21. System Reset

Selecting the Baud Rate of the RS-232 Primary Port

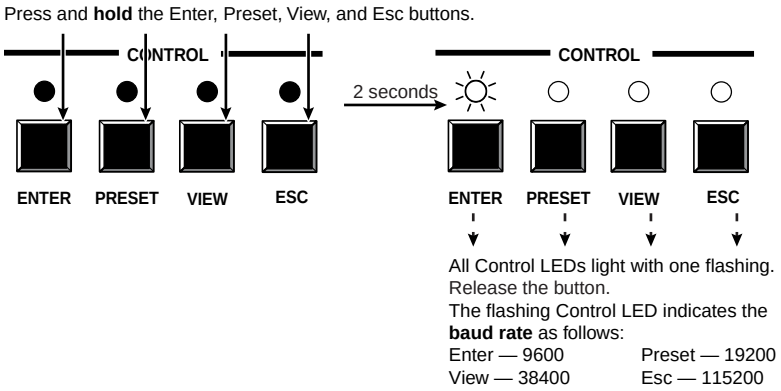
The matrix switcher supports the RS-232 serial communication protocol on the font panel Configuration port and the rear panel RS-232 Primary and RS-232 Secondary ports. All three ports can operate at 9600, 19200, 38400, and 115200 baud rates.

The baud rate for the primary port is variable can be viewed and changed from the front panel.

NOTE: Baud rate is protected when front panel *Lock* mode 2 is selected. You can view the rate in *Lock* mode 2 but you cannot adjust it from the front panel (see "**Setting the Front Panel Locks (Executive Modes)**" on page 47).

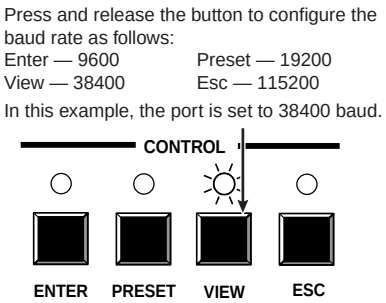
View and configure the serial communications settings of the switcher as follows:

1. **Enter *Serial Port Configuration* mode**: Simultaneously press and **hold all** Control buttons (Enter, Preset, View, and Esc).

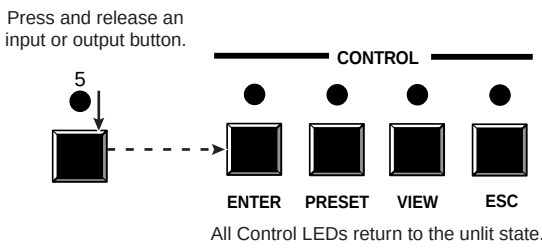


NOTE: If front panel *Lock* mode 2 is selected and you try to perform step **2**, the actions are ignored and the Enter, Video, and Audio buttons flash.

2. **Change a value**: Press and release the button that relates to the desired value.



3. **Exit the *Serial Port Configuration* mode**: Press and release an input or output button.



NOTE: The switcher requires some time to save the new serial port settings. Wait at least 5 minutes before removing power from the switcher or the settings may be lost.

Rear Panel Operations

The rear panel has a Reset button that initiates four levels of resets (identified as modes 1, 3, 4, and 5 for the sake of comparison with an Extron IPL product). The Reset button is recessed, so use a pointed stylus, ballpoint pen, or small screwdriver to access it.

For different reset levels, press and hold the button while the switcher is running or press and hold the button while you apply power to the switcher.

See the following table for a summary of the modes.

CAUTION: Review the reset modes carefully. Using the wrong reset mode may result in unintended loss of flash memory programming, port reassignment, or a controller reboot.

NOTE: The reset modes listed below close all open IP and Telnet connections and close all sockets. Also, the following modes are separate functions, not a continuation from Mode 1 to Mode 5.

Reset Mode Comparison/Summary

Mode	Activation	Result	Purpose/Notes
1	Hold down the recessed Reset button while applying power to the switcher. **NOTE:** After a mode 1 reset is performed, update the switcher firmware to the latest version. Do not operate the switcher firmware version that results from the mode 1 reset. If you want to use the factory default firmware, you must upload that version again (see "**Matrix Software**" for details on uploading firmware.)	The switcher reverts to the factory default firmware. Event scripting will not start if the switcher is powered on in this mode. All user settings and files, such as the current configuration and IP settings, are maintained. **NOTE:** If you do not want to update firmware, or you performed a mode 1 reset by mistake, cycle power to the switcher to return to the firmware version that was running before the mode 1 reset. Use the 0Q SIS command to confirm that the factory default firmware is no longer running (look for the asterisk [*] following the version number.	Use mode 1 to revert to the factory default firmware version if incompatibility issues arise with user-loaded firmware.
3	Hold down the Reset button for about 3 seconds, until the Reset LED blinks once, then press Reset momentarily (<1 second) within 1 second.	**Mode 3** turns events on or off. During resetting, the Reset LED flashes 2 times if events are starting, 3 times if events are stopping.	Mode 3 is useful for troubleshooting.
4	Hold down the Reset button for about 6 seconds, until the Reset LED blinks twice (once at 3 seconds and again at 6 seconds). Then press Reset momentarily (<1 second) within 1 second.	**Mode 4**: • Enables ARP capability • Sets the IP address to the factory default • Sets the subnet address to the factory default • Sets the gateway address to the factory default • Sets port mapping to the factory default • Turns DHCP off • Turn events off The Reset LED flashes three times in quick succession during the reset.	Mode 4 enables you to set IP address information using ARP and the MAC address.
5	Hold down the Reset button for about 9 seconds, until the Reset LED blinks three times (once at 3 seconds, again at 6 seconds, and then again at 9 seconds). Then press Reset momentarily (<1 second) within 1 second.	**Mode 5** performs a complete reset to factory defaults (with the exception of the firmware): • Does everything mode 4 does. • Resets most settings including: clears all ties and presets clears all output mutes • Resets all IP options. • Removes/clears all files for the switcher. The reset LED flashes three times in quick succession during the reset.	Mode 5 is useful if you want to start over with configuration and uploading or to replace events. This mode is the same as Esc ZQQQ ← SIS command.

Performing Soft System Resets (Modes 3, 4, and 5)

Perform a soft reset of the switcher as follows:

1. Use an Extron Tweeker or other small screwdriver to press and **hold** the rear panel Reset button (see figure 22) until the rear panel Reset LED and the front panel Preset and View buttons blink once (events reset), twice (IP settings reset), or three times (absolute reset).
2. Release the Reset button and then **immediately** press and release the Reset button again. Nothing happens if the second momentary press does not occur within 1 second.

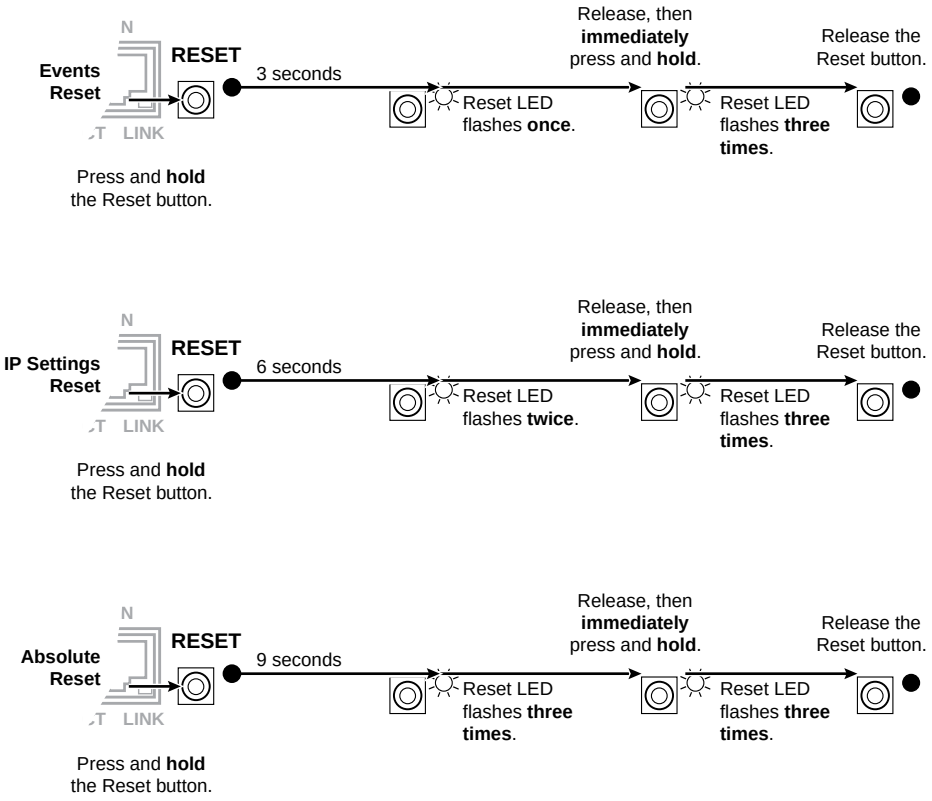


Figure 22. Soft System Resets

Performing a Hard Reset

The hard reset function restores the switcher to the base firmware that it shipped with. After a hard reset, events do not automatically start, but user settings and files are restored. Perform a hard reset as follows:

NOTE: The hard reset restores the factory-installed firmware. The switcher reverts to that factory firmware the next time power is cycled off and on **unless** a firmware update is performed before the power cycle.

1. If necessary, turn off power to the switcher.
2. Press and **hold** the Reset button on the rear panel **while** you apply AC power to the switcher (see figure 23).

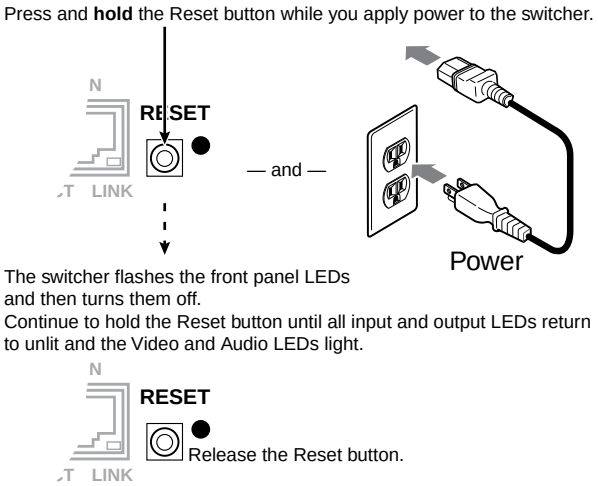

Press and hold the Reset button while you apply power to the switcher.
N
RESET
T LINK
— and —
Power
The switcher flashes the front panel LEDs and then turns them off.
Continue to hold the Reset button until all input and output LEDs return to unlit and the Video and Audio LEDs light.
N
RESET
T LINK
Release the Reset button.

Figure 23. Hard reset

Optimizing the Audio

Each individual input audio level can be adjusted within a range of -18 dB to +24 dB, so there are no noticeable volume differences between sources and for the best headroom and signal-to-noise ratio. Adjust the audio gain and attenuation as follows:

1. Connect audio sources to all desired inputs and connect the audio outputs to output devices such as audio players. See "**Audio input and output**," in the Installation section. For best results, wire all of the inputs and the outputs as balanced.
2. Power on the audio sources, the switcher, and the audio players.
3. Switch among the inputs (see "**Creating Ties**"), listening to the audio with a critical ear or measuring the output audio level with test equipment, such as a VU meter.
4. As necessary, adjust the input audio level of each input (see "**Viewing and Adjusting the Input Audio Level**," in this chapter) so that the approximate output level is the same for all selected inputs.
5. As necessary, adjust the output audio level of each input (see "**Viewing and Adjusting the Output Volume**," in this chapter).

Troubleshooting

This section gives recommendations on what to do if you have problems operating the switcher.

1. Ensure that all devices are plugged in and powered on. The switcher is receiving power if any of the front panel button indicators are lit.
2. Check to see if one or more outputs are muted.
3. Ensure an active input is selected for output on the switcher.
4. Ensure that the proper signal format is supplied.
5. Check the cabling and make corrections as necessary.
6. Call the Extron S3 Sales & Technical Support Hotline if necessary. See the **rear cover** of this guide for the phone number in your region of the world.

Configuration Worksheets

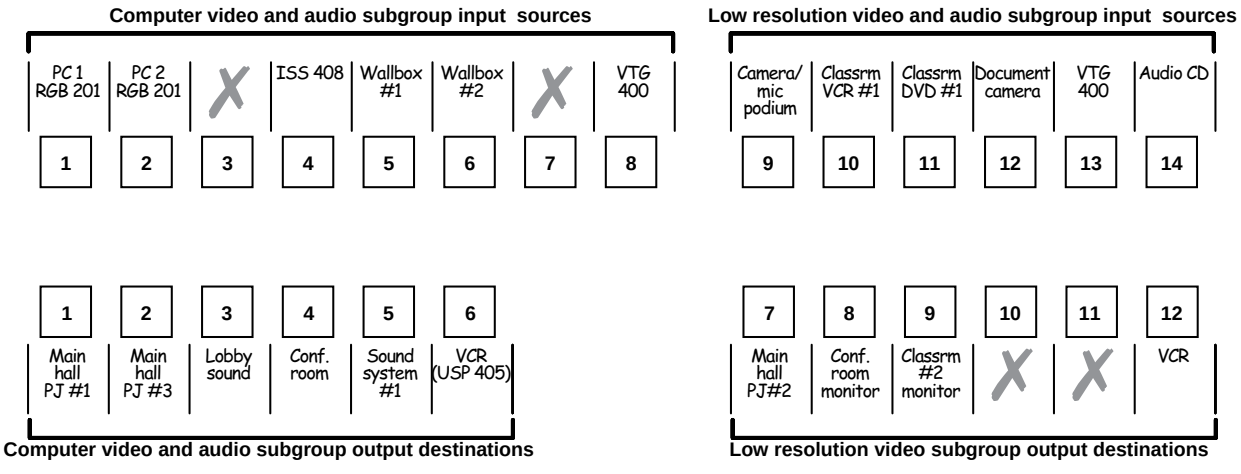
Rather than trying to remember the configuration for each preset, use worksheets to record this information. Make copies of the blank worksheet on **page 57** and use one for each preset configuration. Cross out all unused or inactive inputs and outputs. Use different colors for video and audio.

Worksheet Example 1: System Equipment

Figure 24 shows a worksheet in a fictional organization with the system hardware annotated. Input 3 and 7 and outputs 10 and 11 have no connections in this organization, so they have been crossed out on the worksheet.

Computer video group inputs include PCs, wall boxes and an Extron VTG 400. The low resolution video group inputs include cameras, a VCR, a DVD player, and an audio CD player. Computer video group output devices include monitors, projectors, a stereo, and a VCR for recording presentations. The low resolution video group includes low resolution monitors and audio tape,

The Extron VTG 400 video test generator connected to input 8 or to input 13 enables a video test pattern to be sent to one, several, or all output devices within the video group for problem isolation or adjustment purposes. An audio test tape or CD could be used in a similar manner to check out the audio components connected to the computer video and audio subgroup.



Preset # _____ Title: _____ Video: _____ Audio: _____
Fill in the preset number and use colors, or dashes, and the like to make connecting lines.
Indicate if the configuration is for video, audio, or both.

Figure 24. Worksheet Example 1: System Equipment

Worksheet Example 2: Daily Configuration

Figure 25 continues from worksheet example 1 by showing the video and audio ties that make up the configuration of preset 1. A solid ink line shows video ties and a red pencil lines show the audio ties.

In this example:

- The image of the presenter (solid black line), from the main podium camera (low resolution video input 9), is:
  - Displayed in the main hall (low resolution output 7)
  - Displayed to the overflow crowd in the conference room (low resolution output 8)
  - Tied to the VCR (low resolution output 12) for recording
- The presenter has a presentation on her laptop computer (computer video input 1, dashed black line) that is displayed:
  - Displayed in the main hall (computer video outputs 1 and 2)
  - Displayed to the overflow crowd in the conference room (computer video output 4)
  - Tied, through a scaler, to a VCR (computer video output 6) for recording
- The audio from her microphone (input 9, solid red line) is:
  - Played in the hall (output 5)
  - Sent to the VCR (output 6)
- Classical music from the CD player (input 14, dashed red line) is played in the lobby (output 3)

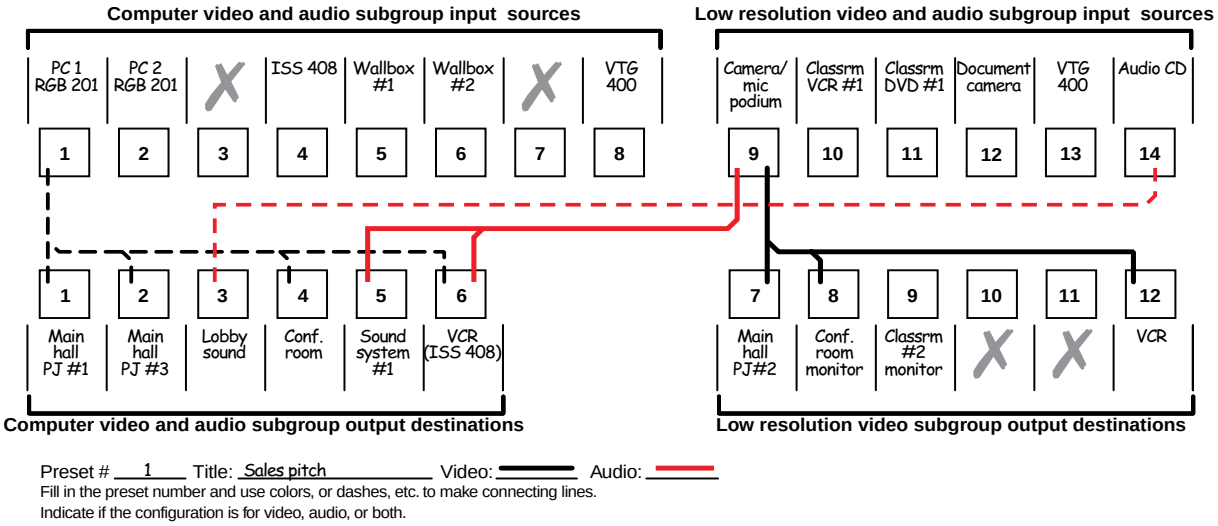
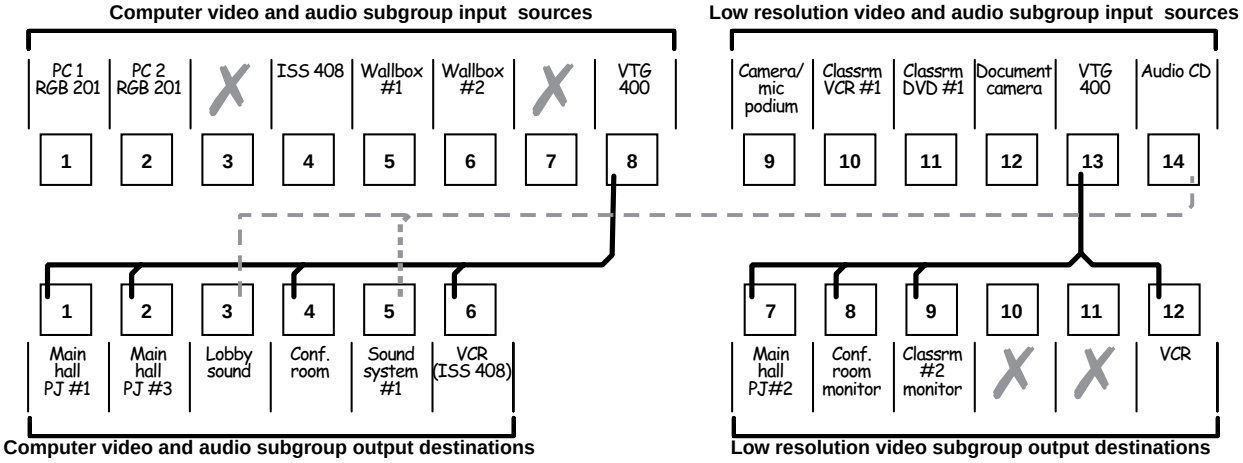


Figure 25. Worksheet Example 2: Daily Configuration

Worksheet Example 3: Test Configuration

The A/V system in our fictional organization needs to be fine tuned on a regular basis. Figure 26 shows a typical test configuration, with an Extron video test generator (inputs 8 and 13) connected to each video group. Each VTG generates a test pattern of the appropriate resolution to all connected outputs. Sound checks are run from the CD player (input 14) to two output devices that accept audio; the VCR (output 6) receives no audio in this configuration. Note that the audio is redirected from the low resolution group to the computer group.

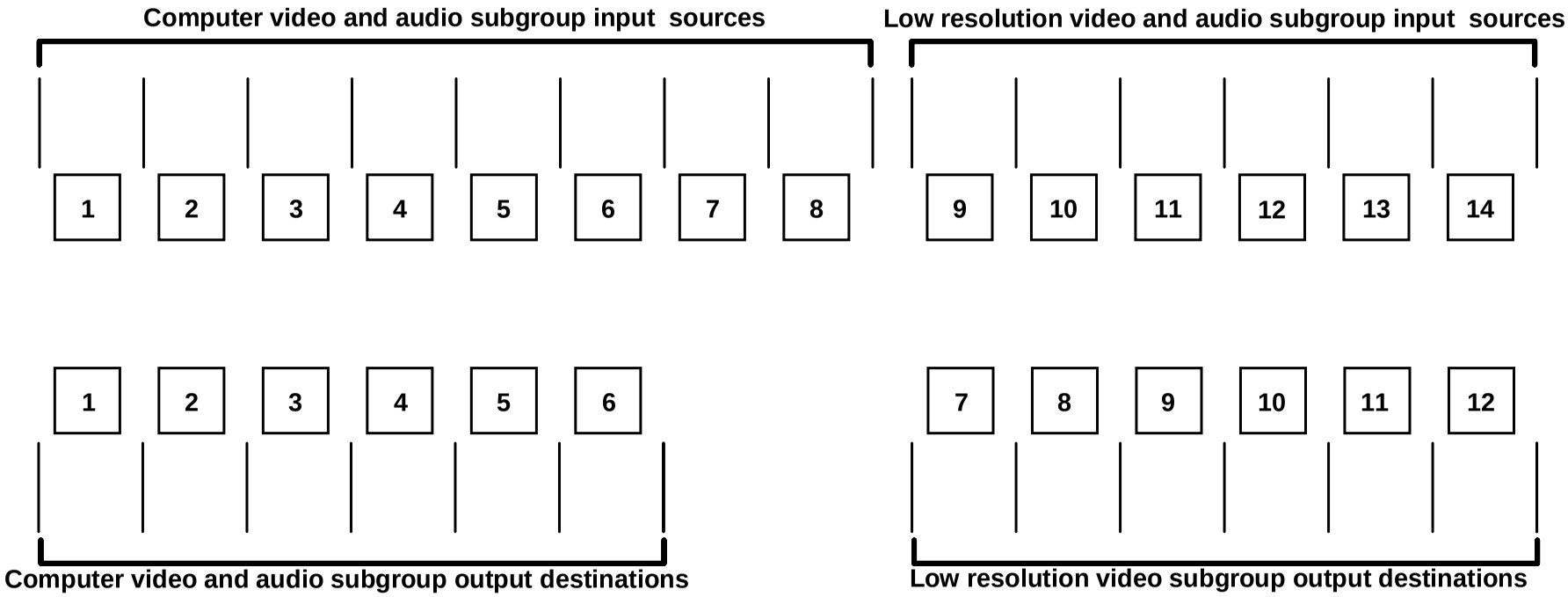


Preset # 16 Title: System tune-up Video: ——— Audio: - - - - -

Fill in the preset number and use colors, or dashes, etc. to make connecting lines.

Indicate if the configuration is for video, audio, or both.

Figure 26. Worksheet Example 3: Test Configuration



Preset # _____ Title: _____ Video: _____ Audio: _____

Fill in the preset number and use colors, or dashes, etc. to make connecting lines.

Indicate if the configuration is for video, audio, or both.

Blank Configuration Worksheet

Programming Guide

This section describes the operation of the MPX 866 A switcher using the Simple Instruction Set, including:

- **RS-232 Ports**
- **Ethernet (LAN) Port**
- **Host-to-Switcher Instructions**
- **Switcher-Initiated Messages**
- **Switcher Error Responses**
- **Using the Command and Response Tables**
- **Special Characters**

RS-232 Ports

The switcher has three serial ports that make serial control of the switcher possible. The ports can be connected to a host device such as a computer running the DataViewer utility, an RS-232 capable PDA, or a control system. The serial ports are:

- Two (Primary and Secondary) rear panel RS-232 ports on 3-pin captive screw connectors
- The front panel Configuration (RS-232) port, a 2.5 mm mini stereo jack

The default protocol for all ports is as follows:

- 9600 baud
- no parity
- 8 data bits
- 1 stop bit
- no flow control

Besides the default 9600 baud, the RS-232 ports can be configured to operate at the 19200, 38400, or 115200 baud rate.

NOTES:

- These three ports are hardwired for RS-232 only.
- The rear panel RS-232 Secondary port is active only if the front panel Configuration port is not in use. If a front panel configuration connection is made, the rear panel RS-232 Secondary port becomes inactive and the front panel Configuration port is active.
- The switcher can operate at 9600, 19200, 38400, or 115200 baud rates, but Extron recommends leaving these ports at 9600 baud **only**. See "**Selecting the Baud Rate of the RS-232 Primary Port**" in the Operation section to configure the RS-232 Primary port from the front panel. See the **Set Serial Port Parameters** SIS command on page 73 to configure all of the ports.

Rear Panel Remote Ports

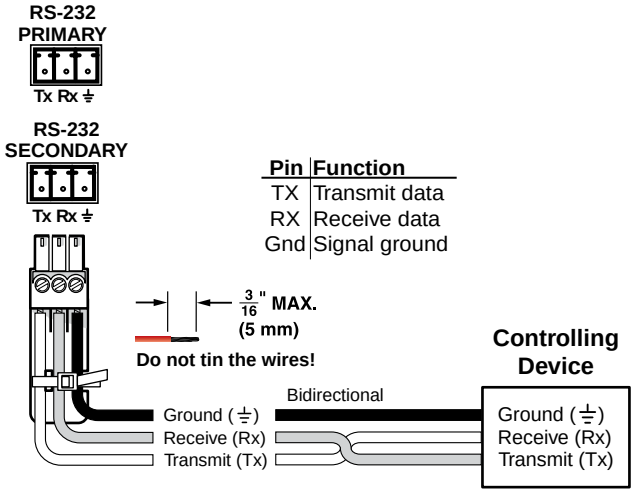
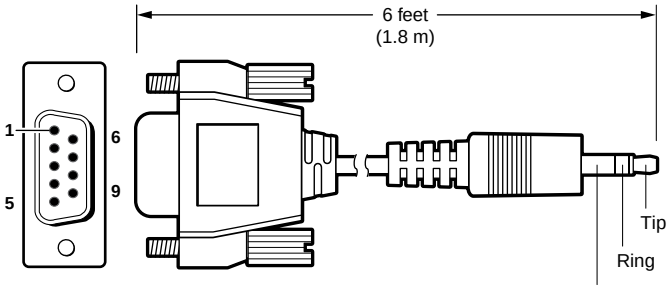


Figure 27. Remote Connector Pin Assignments

Front Panel Configuration Port

NOTE: This port parallels the rear panel RS-232 Secondary port. If a front panel configuration connection is made, the rear panel RS-232 Secondary port becomes inactive and the front panel Configuration port is active.

The optional 9-pin D to 2.5 mm mini jack TRS RS-232 cable, part number **70-335-01** (see figure 28) can be used for connection to the Configuration port.



9-pin D	Connection	TRS Plug
Pin 2	Computer Rx line	Tip
Pin 3	Computer Tx line	Ring
Pin 5	Computer signal ground	Sleeve

Figure 28. Optional 9-pin TRS RS-232 Cable

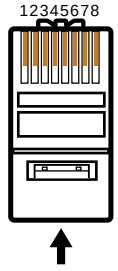
Ethernet (LAN) Port

The rear panel Ethernet connector on the switcher can be connected to an Ethernet LAN or WAN. Communications between the switcher and the controlling device are via Telnet (a TCP socket using port 23). The TCP port can be changed if necessary, via SIS. This connection makes SIS control of the switcher possible using a computer connected to the same LAN or WAN. The SIS commands and the actions of the switcher are identical to the commands and actions the switcher has when communicating with it via RS-232.

Ethernet Connection

The Ethernet cable can be terminated as a straight-through cable or a crossover cable and must be properly terminated for your application (see figure 29).

- **Crossover cable —** Direct connection between the computer and the MPX 866 A switcher
- **Patch (straight-through) cable —** Connection of the MPX 866 A switcher to an Ethernet LAN



Crossover Cable

Pin	End 1 Wire color	End 2 Wire color
1	White-green	White-orange
2	Green	Orange
3	White-orange	White-green
4	Blue	Blue
5	White-blue	White-blue
6	Orange	Green
7	White-brown	White-brown
8	Brown	Brown

T568A T568B

A cable that is wired as T568A at one end and T568B at the other (Tx and Rx pairs reversed) is a "crossover" cable.

Straight-through Cable

Pin	End 1 Wire color	End 2 Wire color
1	White-orange	White-orange
2	Orange	Orange
3	White-green	White-green
4	Blue	Blue
5	White-blue	White-blue
6	Green	Green
7	White-brown	White-brown
8	Brown	Brown

T568B T568B

A cable wired the same at both ends is called a "straight-through" cable, because no pin/pair assignments are swapped.

Figure 29. RJ-45 Ethernet Connector Pin Assignments

Default IP Addresses

To access the MPX 866 A switcher via the LAN port, you need the Extron IP address, and may need the subnet mask and the gateway address. If the IP address has been changed to an address comprised of words and characters, you can determine the actual numeric IP address using the ping utility (see "**Ethernet Connection**" for more details). If the addresses have not been changed, the factory-specified defaults are:

- IP address: 192.168.254.254
- Subnet mask: 255.255.0.0
- Gateway address: 0.0.0.0
- DHCP: off

Establishing a Connection

Establish a network connection to a MPX 866 A switcher as follows:

1. Open a TCP socket using the IP address of the switcher.

   NOTE: If the local system administrators have not changed the value, the factory-specified default, 192.168.254.254, is the correct value for this field.

   The switcher responds with a copyright message including the date, the name of the product, firmware version, part number, and the current date/time.

   NOTE: If the switcher is not password-protected, the device is ready to accept SIS commands immediately after it sends the copyright message.

   If the switcher is password-protected, a `Password` prompt appears below the copyright message.

2. If the switcher is password protected, enter the appropriate administrator or user password.

   If the password is accepted, the switcher responds with `Login User` or `Login Administrator`.

   If the password is not accepted, the `Password` prompt reappears.

Connection Timeouts

The Ethernet link times out after a designated period of time of no communications. By default, this timeout value is set to 5 minutes but the value can be changed.
See the "**Configure port timeout**" SIS commands on page 73.

NOTE: Extron recommends leaving the default timeout at 5 minutes and periodically issuing the Query (Q) command to keep the connection active. If there are long idle periods, Extron recommends disconnecting the socket and reopening the connection when another command must be sent.

Number of Connections

A MPX 866 A switcher can have up to 200 simultaneous TCP connections, including all HTTP sockets and Telnet connections. When the connection limit is reached, the switcher accepts no new connections until some have been closed.

No error message or indication is given that the connection limit has been reached. To maximize performance of an IP Link device, the number of connections should be kept low and unnecessary open sockets should be closed.

Using Verbose Mode

Telnet connections to a MPX 866 A switcher can be used to monitor for changes that occur on the switcher, such as front panel operations and SIS commands from other Telnet sockets or a serial port. For a Telnet session to receive change notices from the switcher, the Telnet session must be in verbose mode 1 or 3. See the "**Verbose mode**" SIS command on page 73.

Host-to-Switcher Instructions

The switcher accepts SIS commands through the RS-232 ports and Ethernet port. SIS commands consist of one or more characters per field. No special characters are required to begin or end a command character sequence. When a command is valid, the unit executes the command and sends a response to the host device. All responses from the unit to the host end with a carriage return and a line feed (CR/LF = ↵), which signals the end of the response character string. A string is one or more characters.

Switcher-initiated Messages

When a local event, such as an equipment power-up, occurs, the unit responds by sending a message to the host. The unit-initiated messages are listed below:

`(c) Copyright 2006, Extron Electronics, MPX 866 A, Vx.xx, 60-825-01 <date/time>↵`

The switcher issues the `Copyright` message (above) when it first powers on. V*x.xx* is the firmware version number and `<date/time>` is the date and time of the connection.

NOTE: `<Date/time>` are reported only if the connection is via the LAN port.

`↵Password:`

The switcher initiates the `Password` message immediately after the copyright message when the controlling system is connected using TCP/IP or telnet and the switcher is password protected. This message means that the switcher requires an administrator or user level password before it will perform the commands entered via this link. The switcher repeats the password message response for every entry other than a valid password.

`↵Login Administrator↵`

`↵Login User↵`

The switcher initiates the `Login` message when a correct administrator or user password has been entered. If the user and administrator passwords are the same, the switcher defaults to administrator privileges.

`Qik↵`

The switcher initiates the `Qik` message when a front panel switching operation has occurred.

`Spr`*nn*`↵`

The switcher initiates the `Spr` message when a global preset has been saved from the front panel. *nn* is the preset number.

`Rpr`*nn*`↵`

The switcher initiates the `Rpr` message when a global preset has been recalled from the front panel. *nn* is the preset number.

`In`*nn*`Aud`*xx*`↵`

The switcher initiates the `Aud` message when a front panel input audio level change has occurred. *nn* is the input number and *xx* is the dB level.

`Typ`*nn*`•`*x*`↵`

The switcher initiates the Typ message when the video format for a video input is changed from the front panel. *nn* is the input number, • is a space, and *x* is the format: 1 = composite video, 0 = S-video.

Out*nn*Vol*xx*↵

The switcher initiates the `Vol` message when a front panel output audio volume change has occurred. ***nn*** is the input number and ***xx*** is the volume level.

Vmt*nn*•*x*↵

The switcher initiates the Vmt message when a video output mute is toggled on or off from the front panel. "*nn*" is the output number, • is a space, and "*x*" is the mute status: 1 = on, 0 = off.

Amt*nn***x*↵

The switcher initiates the `Amt` message when an audio or RS-232 output mute is toggled on or off from the front panel. ***nn*** is the output number and ***x*** is the mute status: 1= on, 0 = off.

Exe*n*↵

The switcher initiates the `Exe` message when the front panel *Lock* mode is changed from the front panel. ***n*** is the *Lock* mode: 0, 1, or 2. See "**Setting the Front Panel Locks (Executive Modes**" for Lock mode definitions.

Switcher Error Responses

When the switcher receives a valid SIS command, it executes the command and sends a response to the host device. If the unit is unable to execute the command because the command is invalid or it contains invalid parameters, the unit returns an error response to the host. The error response codes are:

E01 — Invalid input channel number (too large)
E10 — Invalid command
E11 — Invalid preset number
E12 — Invalid output number (too large)
E13 — Invalid value (out of range)
E14 — Illegal command for this configuration
E17 — Timeout (caused only by direct write of global presets)
E24 — Privilege violation (Ethernet, Extron software only)

Using the Command and Response Tables

The command and response table begins on **page 65**. Either uppercase or lower case letters are acceptable in the command field except where indicated for the audio level (gain and attenuation) commands. Symbols are used throughout the table to represent variables in the command and response fields. Command and response examples are shown throughout the table. The ASCII to HEX conversion table below is for use with the command and response table.

ASCII to Hex Conversion Table

Space →	20	!	21	"	22	#	23	$	24	%	25	&	26	'	27
(	28	)	29	*	2A	+	2B	,	2C	-	2D	.	2E	/	2F
0	30	1	31	2	32	3	33	4	34	5	35	6	36	7	37
8	38	9	39	:	3A	;	3B	<	3C	=	3D	>	3E	?	3F
@	40	A	41	B	42	C	43	D	44	E	45	F	46	G	47
H	48	I	49	J	4A	K	4B	L	4C	M	4D	N	4E	O	4F
P	50	Q	51	R	52	S	53	T	54	U	55	V	56	W	57
X	58	Y	59	Z	5A	[	5B	\	5C	]	5D	^	5E	_	5F
`	60	a	61	b	62	c	63	d	64	e	65	f	66	g	67
h	68	i	69	j	6A	k	6B	l	6C	m	6D	n	6E	o	6F
p	70	q	71	r	72	s	73	t	74	u	75	v	76	w	77
x	78	y	79	z	7A	{	7B	|	7C	}	7D	~	7E	DEL	7F

Esc	1B	CR	0D	LF	0A

Command and Response Table for SIS Commands

Symbol Definitions

↵ = CR/LF (carriage return/line feed) (hex 0D 0A)

← = Carriage return (no line feed, hex 0D)

| = Pipe (can be used interchangeably with the ← character)

• = Space character

Esc = Escape key (hex 1B)

NOTE: A video input from either of the two groups cannot be tied to an output in the other group. Audio can be tied to any output, regardless of the video group to which it was input.

X1	= Input number (for tie)	00 = untied 01 – 08 for the computer video group 09 – 14 for the low resolution video group
X2	= Output number	01 – 12 for video 01 – 06 for audio
X3	= Input number	01 – 08 for the computer video group 09 – 14 for the low resolution video group
X4	= Input signal format	1 = composite video (default) 2 = S-video
X5	= Mute status	0 = off, 1 = on
X6	= Volume adjustment range	00 – 64 (1 dB per step except for 0-to-1, which is 34.5 dB) (**see the table** on page 67)
X7	= Numeric dB value	–18 to +24 (45 steps of gain or attenuation) (default = 0)
X8	= Audio gain	0 – 24 (1 dB per step)
X9	= Audio attenuation	1 – 18 (1 dB per step)
X10	= Global preset #	32 maximum (0 = current configuration)
X11	= Video and audio mute:	0 = no mutes 1 = video mute 2 = audio mute 3 = video and audio mute
X12	= Name (for global presets, inputs, and outputs)	12 characters maximum Upper- and lower-case alphanumeric characters are valid.

NOTE: The following characters are invalid or not recommended in the name: ~ , @ ‘ [ ] { } < > ’ “ ; | \ and ?.

X13	= Signal detection	0 = no input detected, 1 = input detected)
X14	= Firmware version number to second decimal place (x.xx)	
X15	= Verbose firmware version-description-upload date/time (see **page 71**).	
X16	= Voltage	Positive or negative voltage and magnitude
X17	= Temperature	Degrees Fahrenheit
X18	= Front panel locks (*Executive* modes)	0 = Mode 0 1 = Mode 1 2 = Mode 2

Command and Response Table for SIS Commands

Command	ASCII Command (Host to Unit)	Response (Unit to Host)	Additional description
Create ties			
NOTES: • The **!** **tie** command for RGB and **%** **tie** command for video can be used interchangeably for ties within the same group. • Video ties **cannot** be made between the computer video group and the low resolution video group. • Video and audio ties between the low resolution video input subgroup and the low resolution video output subgroup are made with the audio automatically redirected. In such an operation, the switcher automatically ties the audio to an output in the computer video/audio outputs subgroup (outputs 1 through 6). See "**Creating a Configuration**," on page 24 to identify the outputs to which audio inputs are tied. • The matrix switcher supports 1- and 2-digit numeric entries (1*1 and 02*02). • Commands can be entered back-to-back in a string, with no spaces. For example: 1*1!02*02&3*03%. • The quick multiple tie and tie input to all output commands activate all I/O switches simultaneously.			
Tie input X1 to output X2, video and audio	X1*X2!	Out X2 • In X1 • All ↵ *— or —* Qik ↵	Tie the video and audio on input X1 to output X2.
NOTE: The response is Out X3 • In X1 • All ↵ when the video and audio ties are made between the computer video input group and the computer/audio output group, because audio always follows the video. The response is Qik ↵ when video and audio ties are made between the low resolution video input group and the low resolution video output group, because audio is automatically broken away to the computer/audio group.			
Example (computer video group tie):	1*3!	Out03•In01•All ↵	Tie input 1 video and audio to output 3.
Example (low resolution video group tie):	9*9!	Qik ↵	Tie input 9 video to output 9. The switcher automatically redirects the audio to output 3.
Tie input X1 to output X2, RGB (video) only	X1*X2&	Out X2 • In X1 • RGB ↵	Tie the video for input X1 to output X2. Video is broken away.
Example (see the 1st bulleted note, above):	5*4&	Out04•In05•RGB ↵	Tie input 5 RGB to output 4.
Tie input X1 to output X2, video only	X1*X2%	Out X2 • In X1 • Vid ↵	Tie the video for input X1 to output X2. Video is broken away.
Example (see the 1st bulleted note, above):	9*7%	Out07•In09•Vid ↵	Tie input 9 video to output 7.
Tie input X1 to output X2, audio only	X1*X2$	Out X2 • In X1 • Aud ↵	Tie the audio for input X1 to output X2. Audio is broken away.
NOTE: Audio ties can only be made to the computer video/audio subgroup (outputs 1 through 6). The switcher responds with an E13 error if you try to make an audio-only tie to outputs 7 through 12.			
Example:	12*4$	Out04•In12•Aud ↵	Tie input 12 audio to output 4.
Quick multiple tie	Esc+Q X1*X2! ... X1*X2$ ←	Qik ↵	
NOTE: All video and audio group rules apply to the quick multiple tie command.			
Example:	Esc+Q3*4!3*11%13*6$ ←	Qik ↵	Tie input 3 video and audio to output 4, tie input 11 video to output 12, and tie input 13 audio to output 6.

NOTE: X1 = Input number (for tie)
00 (untied)
01 – 08 for the computer video group
09 – 14 for the low resolution video group

X2 = Output number
01 – 12 for video
01 – 06 for audio

Command/Response Table for SIS Commands (continued)

Command	ASCII Command (Host to Unit)	Response (Unit to Host)	Additional description
Create ties (continued)			
NOTES: • All video and audio group rules apply to all of the tie all commands listed below. • The **!** **tie all** command for RGB and **%** **tie all** command for video can be used interchangeably for ties within the same group.			
Tie input to all outputs, video and audio	X1*!	InX1•All↵	
Example:	5*!	In05•All↵	Tie input 5 video and audio to all computer video/audio group outputs **only**.
Example:	12*!	In12•All↵	Tie input 12 video to all low resolution video groups **only**. Tie input 12 audio to all computer/audio group outputs **only**.
NOTE: 0*! clears all ties.			
Tie input to all outputs, RGB (video) only	X1*&	InX1•RGB↵	Video is broken away.
Example (see the 2nd bulleted Note, above):	8*&	In08•RGB↵	Tie input 8 RGB to all computer video group outputs **only**.
Tie input to all outputs, video only	X1*%	InX1•Vid↵	Video is broken away.
Example (see the 2nd bulleted Note, above):	10*%	In10•Vid↵	Tie input 10 video to all low resolution video group outputs **only**.
Tie input to all outputs, audio only	X1*$	InX1•Aud↵	Audio is broken away.
Read ties			
NOTES: • The **!** **read tie** command for RGB and the **%** **read tie** command for video can be used interchangeably. • When the switcher is in verbose mode 1 or 3, the response is Out**X1**•In**X3**•(RGB), (Vid), or (Aud)↵.			
Read tied input, RGB output	X2&	X1↵	Input X1 video is tied to output X2.
Read tied input, Video output	X2%	X1↵	Input X1 video is tied to output X2.
Read tied input, audio output	X2$	X1↵	Input X1 audio is tied to output X2.
Configure input format			
Configure input as composite video	X3*1\	TypX3*1↵	Define input X3 as composite video.
Example:	11*1\	Typ11*1↵	Configurable input 11 is set as composite video.
Configure input as S-video	X3*2\	TypX3*2↵	Define input X3 as S-video.
View input configuration	X3\	X4↵	Show the configuration of input X3.
Video mute commands			
Video mute	X2*1B	VmtX2*1↵	Mute output X2 video (video off).
Video unmute	X2*0B	VmtX2*0↵	Unmute output X2 video (video on).
Read video mute status	X2B	X5↵	
Global video mute	1*B	Vmt1↵	Mute all video outputs.
Global video unmute	0*B	Vmt0↵	Unmute all video outputs.

NOTE:

X1 = Input number (for tie)	00 (untied)	
	01 – 08 for the computer video group	
	09 – 14 for the low resolution video group	
X2 = Output number	01 – 12 for video	
	01 – 06 for audio	
X3 = Input number	11 – 14 (the only valid inputs for the " / " command)	
X4 = Input signal format	1 = composite video	2 = S-video
X5 = Mute status	0 = off	1 = on

Command/Response Table for SIS Commands (continued)

Command	ASCII Command (Host to Unit)	Response (Unit to Host)	Additional description
Audio output volume			
NOTE: The table below the commands defines the value of each audio volume step.			
Set the audio volume to a specific value	X2*X6V	Out X2 •Vol X6 ↵	
Example:	1*50V	Out01•Vol50↵	Set output 1 volume to 79%.
Increment volume	X2+V	Out X2 •Vol X6 ↵	Increase volume by 1 step.
Example:	1+V	Out01•Vol51↵	Increment audio volume from 79% to 80.5%.
Decrement volume	X2-V	Out X2 •Vol X6 ↵	Decrease volume by 1 step.
Read output volume	X2V	X6↵	

X6 value/ # of steps	dB of attenuation	Output volume	X6 value/ # of steps	dB of attenuation	Output volume	X6 value/ # of steps	dB of attenuation	Output volume
00	76	0%						
01	63	5.5%	23	41	38.5%	45	19	71.5%
02	62	7%	24	40	40%	46	18	73%
03	61	8.5%	25	39	41.5%	47	17	74.5%
04	60	10%	26	38	43%	48	16	76%
05	59	11.5%	27	37	44.5%	49	15	77.5%
06	58	13%	28	36	46%	50	14	79%
07	57	14.5%	29	35	47.5%	51	13	80.5%
08	56	16%	30	34	49%	52	12	82%
09	55	17.5%	31	33	50.5%	53	11	83.5%
10	54	19%	32	32	52%	54	10	85%
11	53	20.5%	33	31	53.5%	55	9	86.5%
12	52	22%	34	30	55%	56	8	88%
13	51	23.5%	35	29	56.5%	57	7	89.5%
14	50	25%	36	28	58%	58	6	91%
15	49	26.5%	37	27	59.5%	59	5	92.5%
16	48	28%	38	26	61%	60	4	94%
17	47	29.5%	39	25	62.5%	61	3	95.5%
18	46	31%	40	24	64%	62	2	97%
19	45	32.5%	41	23	65.5%	63	1	98.5%
20	44	34%	42	22	67%	64	0	100%
21	43	35.5%	43	21	68.5%			
22	42	37%	44	20	70%			

NOTE: X2 = Output number 01 – 06 for audio
X6 = Volume adjustment range 00 – 64 (see the table above)

Command/Response Table for SIS Commands (continued)

Command	ASCII Command (Host to Unit)	Response (Unit to Host)	Additional description
Audio input gain and attenuation			
NOTE: The set gain (**G**) and set attenuation (**g**) commands **are** case sensitive.			
Set input audio gain to +dB value	X3*X8G	InX3•AudX7↵	
Example:	1*2G	In01•Aud+02↵	Set input 1 audio gain to +2 dB.
Set input audio attenuation to -dB value	X3*X9g	InX3•AudX7↵	
Increment gain	X3+G	InX3•AudX7↵	Increase gain by 1 dB.
Example:	5+G	In05•Aud+03↵	Increase input 5 audio level from +2 dB to +3 dB.
Decrement gain	X3-G	InX3•AudX7↵	Decrease gain by 1 dB.
Example:	7-G	In07•Aud-09↵	Decrease input 7 audio level from -8 dB to -9 dB.
Read input gain	X3G	X7↵	
Audio mute commands			
Audio mute	X1*1Z	AmtX1*1↵	Mute output X1 audio (audio off).
Audio unmute	X1*0Z	AmtX1*0↵	Unmute output X1 audio (audio on).
Read audio mute	X1Z	X5↵	1 = mute on, 0 = mute off.
Global audio mute	1*Z	Amt1↵	Mute all audio outputs.
Global audio unmute	0*Z	Amt0↵	Unmute all audio outputs.
Save, recall, and directly write presets			
NOTES: • If you try to recall a preset that is not saved, the matrix switcher responds with the error code E11. • The following characters are invalid or not recommended or not recommended in preset names: + - , ` @ = [ ] { } ' " ; : | \ and ?.			
Save current configuration as a global preset	X10,	SprX10↵	Command character is a comma.
Example:	9,	Spr9↵	Save current ties as preset 9.
Recall a global preset	X10.	RprX10↵	Command character is a period.
Example:	5.	Rpr05↵	Recall preset 5, which becomes the current configuration.
Direct write process —			
NOTE: The direct **write** of a global preset should always be preceded by a **clear** global preset ties command of that same preset number, as shown below. In a directly-written preset, the tied input of each output position (or no tied input) remains unchanged unless overwritten or cleared. If you do not **clear** the ties in a global preset number before you directly **write** a global preset to that number, ties that are part of the previous version of the specified preset with the same number can unexpectedly become part of the newly-created preset.			
Clear ties of a global preset	Esc+X10P0*!←	SprX10↵	Clear all ties in preset X10.
Directly write a global preset	Esc+X10PX1*X2!X1*X2%X1*X2$ ... X1*X2%← SprX10↵		Enter as many ties as are valid for this configuration. The **! tie** all, **& tie** RGB, **% tie** video, and **$ tie** audio commands are all valid.
Example:	Esc+27P0*!←	Spr27↵	Clear all ties in preset 27.
	Esc+27P2*5!10*2$13*11%3*6&← Spr27↵		Brackets are shown to separate ties for clarity only. Create global preset 27, which ties input 2 video and audio to output 5, input 10 audio to output 2, input 13 video to output 11, and input 3 video to output 8.

NOTE:

X1 = Input number (for tie)	00 (untied)	01 – 08 for the computer group	09 – 14 for the low resolution group
X2 = Output number	01 – 12 for video	01 – 06 for audio	
X3 = Input number	11 – 14 (the only valid inputs for the / command)		
X5 = Mute status	0 = off	1 = on	
X7 = Numeric dB value	–18 to +24 (45 steps of gain or attenuation) (default = 0)		
X8 = Audio gain	0 – 24 (1 dB per step)		
X9 = Audio attenuation	1 – 18 (1 dB per step)		
X10 = Global preset #	32 maximum		

Command/Response Table for SIS Commands (continued)

Command	ASCII Command (Host to Unit)	Response (Unit to Host)	Additional description
Preset names			
Write global preset name	Esc X10 , X12 NG ↵	Nmg X10 , X12 ↵	
Example:	Esc 1 , Security 1 NG ↵	Nmg01 , Security 1 ↵	Name global preset 1 "Security 1".
Read global preset name	Esc X10 NG ↵	X12 ↵	
Example:	Esc 2NG ↵	Security 2 ↵	
View ties, gain, volume, mutes, and presets			
NOTES: • The **! read tie** command for RGB and the **% read tie** command for video can be used interchangeably. • When the switcher is in verbose mode 1 or 3, the response is Out X2 • In X1 • (RGB), (Vid), or (Aud) ↵.			
View output video (RGB) tie	X2 &	X1 ↵	
Example:	5&	07 ↵	Input 7 computer video is tied to output 5.
View output video tie	X2 %	X1 ↵	
Example:	7%	12 ↵	Input 12 low resolution video is tied to output 7.
View output audio tie	X2 $	X1 ↵	
Example:	3$	06 ↵	Input 6 audio is tied to output 3.
View output volume	X2 V	X6 ↵	
Example:	7V	55 ↵	Volume for output 7 is 55%.
View input gain	X1 G	X7 ↵	
Example:	4G	–02 ↵	Gain for input 4 is -2 dB.
View output mutes	Esc VM ↵	X11[1] X11[2] ... X11[12] ↵	Each X11 response is the mute status of an output, starting from output 1.
Example:	Esc VM ↵	Mut023010000000 ↵	Output 2 audio is mute, output 3 video and audio are muted, and output 5 video is muted. All other outputs are unmuted.
NOTE: The "Mut" portion of the response appears only when the switcher is in Verbose mode 1 or 3. See the **Verbose mode** command on **page 73**.			
View input configuration	X3 \	X4 ↵	Show the configuration of input X3.
NOTE: The only valid input (X3) numbers are 11 through 14.			
View global video preset configuration	Esc X10 * X2 * 1VC ↵	X1[1] • X1[2] • ... • X1[16] • Vid ↵	Show the configuration of preset X10. Show the input tied to 12 sequential outputs, starting from output X1. (Video outputs 13 through 16 do not exist on this switcher model.)
Command description:	preset # (X7) * starting output # (X2) (should always be "1" for this switcher) *1 (= video) VC		
Response description:	input # (X1) tied to output 1 • X1 tied to output 2 • X1 tied to output 3 • ... • X1 tied to output 16 • Vid ↵		
Example:	Esc 4*1*1VC ↵		

Input 4 tied to output 3 — No tied input

Response = tied input: 08•08•04•08•08•00•09•00•10•10•10•10•--•--•--•--•Vid↵

Output: 01 02 03 04 05 06 | 07 08 09 10 11 12 | 13 14 15 16

Computer/Audio Group | Video Group | Non-existent outputs

Each position shown in the response is an output: left = output 1 (the starting output number), right = output 16. The number in each position is the input tied to that output. Outputs 13 through 16 do not exist on this matrix switcher; the content of those positions is "--".

In this example, video input 8 is tied to outputs 1, 2, 4, and 5; video input 4 is tied to output 3, video input 9 is tied to output 7; video input 10 is tied to outputs 9, 10, 11, and 12. No inputs are tied to outputs 6 and 8.

NOTE: Esc X10 *1*1VC ↵ where X10 = 0 returns the current video configuration of the switcher.

NOTE:

X1 = Input number (for tie)	00 (untied)	01 – 08 for the computer group	09 – 14 for the low resolution group	
X2 = Output number	01 – 12 for video	01 – 06 for audio		
X3 = Input number	11 – 14 (the only valid inputs for the / command)			
X5 = Mute status	0 = off	1 = on		
X10 = Global preset #	32 maximum			
X11 = Video and audio mute:	0 = no mutes	1 = video mute	2 = audio mute	3 = video and audio mute
X12 = Name	12 characters maximum			

Command/Response Table for SIS Commands (continued)

Command	ASCII Command (Host to Unit)	Response (Unit to Host)	Additional description
View ties, gain, volume, mutes, and presets (continued)			
View audio global preset configuration	Esc X10 *X2*2VC←	X1[1]•X1[2]• ... •X1[16]•Aud↵	Show the audio configuration for preset X10. Show the input tied to 16 sequential outputs, starting from output X1. (Audio outputs 7 through 16 do not exist on this switcher model.)
Command description:	preset # (X10)*starting output # (X2) (should always be "1" for this switcher)*2 (= audio)VC		
Response description:	input # (X1) tied to output 1•X1 tied to output 2•X1 tied to output 3• ... •X1 tied to output 16•Aud↵		
Example:	Esc4*1*2VC←		

Input 6 tied to output 3 — Input 12 tied to output 6

Response = tied input: 02•04•06•08•10•12•--•--•--•--•--•--•--•--•--•--•Aud↵

Output: 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16

Computer/Audio Group — Non-existent outputs

Each position shown in the response is an output: left = output 1 (the starting output number), right = output 16. The number in each position is the input tied to that output. Outputs 7 through 16 do not exist on this matrix switcher; the content of those positions is "--".

In this example, audio input 2 is tied to output 1, input 4 is tied to output 2, input 6 is tied to output 3, input 8 is tied to output 4, input 10 is tied to output 5, and input 12 is tied to output 6.

NOTE: Esc X10 *1*2VC← where X10 = 0 returns the current audio configuration of the switcher.

NOTE: The response to the View File Directory command differs, depending on whether the command is sent via an RS-232 or Telnet connection or sent via a web browser connection.

View file directory RS232/RS422 port and Telnet	EscDF←	<*filename1*>,<*date*/*time*>,<*length*>↵ <*filename2*>,<*date*/*time*>,<*length*>↵ <*filename3*>,<*date*/*time*>,<*length*>↵ • • • • <*filename*n>,<*date*/*time*>,<*length*>↵ <*# of Bytes*>•Left↵↵
View file directory web browser	EscDF←	Var file = new array (); File [1] = '<*filename1*>,<*date1*>,<*filesize1*>'; File [2] = '<*filename2*>,<*date2*>,<*filesize2*>'; File [3] = '<*filename3*>,<*date3*>,<*filesize3*>'; • • • • filename<*n*>File [<*n*>] = '<*filename*n>,<*daten*>,<*filesizen*>'; File [<n+1>] = <*# of Bytes*>•Left
Erase user-supplied web pages/files	Esc<*filename*>EF←	Del<*filename*>↵
Input signal active		
List input signal status for all inputs	0LS	X12[1],X12[2],X12[3], ... ,X12[14]↵ Each X13 value is an input.

NOTE:

X1 = Input number (for tie): 00 (untied); 01 – 08 for the computer video group; 09 – 14 for the low resolution video group

X2 = Output number: 01 – 12 for video; 01 – 06 for audio

X10 = Global preset #: 32 maximum

X13 = Signal detection: 0 = no input detected; 1 = input detected

Command/Response Table for SIS Commands (continued)

Command	ASCII Command (Host to Unit)	Response (Unit to Host)	Additional description
***Lock* (executive) modes**			
NOTE: See "**Setting the Front Panel Locks (Executive Modes)**" in the Operation section for more information on the Lock modes.			
Lock all front panel functions	1X	Exe1↵	Enable *Lock* mode 1.
Lock advanced front panel functions	2X	Exe2↵	Enable *Lock* mode 2.
Unlock all front panel functions	0X	Exe0↵	Enable *Lock* mode 0.
View lock status	X	X18↵	
Resets			
Reset global presets and names	EscZG←	Zpg↵	Clear all global presets and their names.
Reset **one** global preset	EscX10ZG←	ZpgX10↵	Clear global preset X10.
Reset audio input levels	EscZA←	Zpa↵	Reset all audio input levels (gain and attenuation) to 0 dB.
Reset audio output levels	EscZV←	Zpv↵	Reset all audio output levels (volume) to 100% (no attenuation).
Reset all mutes	EscZZ←	Zpz↵	Unmute all outputs.
Reset whole switcher	EscZXXX←	Zpx↵	Clear all ties and presets, reset all all audio gains to 0 dB, and reset volume to 100%.
Absolute reset	EscZQQQ←	Zpq↵	Similar to **Reset whole switcher**, plus clear all UART ports, reset the IP address to 192.168.254.254 and reset the subnet mask to 255.255.000.000.
Information requests			
Information request	I	V14X12•A14X06↵	This matrix switcher has 14 video and audio inputs by 12 video and 6 audio outputs.
Request part number	N	60-825-01↵	
NOTE: There are up to three separate sets of Extron firmware on which the switcher can report: the controller firmware, which is the overall control firmware; the Ethernet protocol firmware, which handles the Ethernet interface; and the latest optional Extron firmware update, which is available at **www.extron.com**.			
Query firmware version	Q	X14↵	
Query controller firmware version (verbose)	0Q	X14-X15-X15↵	Provide a detailed status of the Ethernet protocol firmware, the controller firmware, and any firmware upgrade. An asterisk (*) marks the firmware that is running is by . A caret (^) marks that the firmware has a bad checksum or an invalid load. ?.?? marks that firmware is not loaded.
Response description:	*Ethernet protocol firmware version-controller firmware version-updated firmware version*↵		
Example:	0q		
Request system status	S	X16•X16•X16•X16•X16•X16•X16•X17↵	
Response description:	S	+3.3V•+5V•–5V•+2.5V•–15V•+15V•Temp↵	
Example:	S	3.29•5.04•-5.14•2.48•-15.27•15.15•120.20↵	

Example response annotations:

- `1.23-0.14(0.20-MPX866Series -Thu, 20 Jul 2006 00:00:00 GMT)-0.25*(0.24-64x64 Series -Fri, 28 Jul 2006 16:39:21 GMT)↵`
  - Description
  - * indicates the version running
  - Upload date and time
  - Ethernet protocol firmware
  - MPX firmware version
  - Updated firmware version
- `3.29•5.04•-5.14•2.48•-15.27•15.15•120.20↵`
  - +15V power system at +15.15V
  - 3.3V power system at 3.29V
  - Temperature 120.20 degrees

NOTE:
- X10 = Global preset # — 32 maximum
- X14 = Firmware version number to second decimal place (x.xx)
- X15 = Verbose firmware version-description-upload date/time. See above.
- X16 = Voltage — Positive or negative voltage and magnitude
- X17 = Temperature — Degrees Fahrenheit
- X18 = Front panel locks (Executive modes) — 0 = Mode 0, 1 = Mode 1, 2 = Mode 2

Command and Response Table for IP-Specific SIS Commands

Symbol definitions

X21 = Web page priority
0 = internal
1 = user

X22 = Matrix name
(Up to 240 alphanumeric characters)

NOTE: The following characters are invalid or not recommended in the name: {space} + ~ , @ = ` [ ] { } < > ‘ “ ” ; : | \ and ?.

X23 = Default name
Factory default name (model name + last 3 pairs of MAC address)

X24 = Time and date (set)
In the format: MM/DD/YY•HH:MM:SS where:
MM = month: 01 (January) through 12 (December)
DD = day: 01 through 31
YY = year: 00 through 99
HH = hour: 00 through 24
MM = minutes: 00 through 59
SS = seconds: 00 through 59

X25 = Time and date (read)
In the format: Day,•DD•Mmm•YYYY•HH:MM:SS where
Day = weekday: Mon through Sun
DD = day: 01 through 31
Mmm = month: Jan through Dec
YYYY = year: 2000 through 2099
HH = hour: 00 through 24
MM = minutes: 00 through 59
SS = seconds: 00 through 59

X26 = GMT offset
-12.0 through +14.0 (hours and minutes removed from GMT)

X27 = Daylight Savings Time
0 = Daylight Savings Time off/ignore
1 = Daylight Savings Time on (northern hemisphere)
2 = Daylight Savings Time on (Europe)
3 = Daylight Savings Time on (Brazil)

X28 = IP address
###-###-###-###

X29 = Hardware (MAC) address
##-##-##-##-##-##

X30 = Number of open connections
0 - 255

X31 = Password
12 alphanumeric characters

NOTE: The following characters are invalid or not recommended in passwords: {space} + ~ , @ = ` [ ] { } < > ‘ “ ” ; : | \ and ?.

X32 = DHCP
0 = off, 1 = on

X33 = Port #
01 = rear panel RS-232 Primary port
02 = rear panel RS-232 Secondary port/front panel Configuration port

NOTE: The rear panel RS-232 Secondary port (X33 = 02) is active only if the front panel Configuration port is not in use. If a front panel configuration connection is made, the rear panel RS-232 Secondary port becomes inactive and the front panel Configuration port is active.

X34 = Baud rate
9600, 19200, 38400, 115200

X35 = Parity
Odd, even, none, mark, space (only first letter required)

X36 = Data bits
7, 8

X37 = Stop bits
1, 2

X38 = Verbose mode
0 = Clear/none (default for Telnet connection
1 = Verbose mode (default for RS-232 connection)
2 = Tagged responses for queries
3 = Verbose mode and tagged for queries

NOTE: If tagged responses is enabled, all read commands return the constant string and the value as the set command does (for example, the read matrix name command, Esc CN ←, returns IPN•X22 ↵).

X39 = Security level
00 = Anonymous
10 = Extended security levels 1 through 10
11 = User
12 = Administrator

X40 = Port timeout interval
1 (= 10 seconds) – 65000 (default is 30 = 300 seconds = 5 minutes)

Command and Response Table for IP-Specific SIS Commands

Command	ASCII Command (Host to Unit)	Response (Unit to Host)	Additional description
IP setup commands			
Set Web page priority	Esc X21 Cpag ←	Iwp X21 ↵	
Read Web page priority	Esc Cpag ←	X21 ↵	
Set matrix name (location)	Esc X22 CN ←	Ipn• X22 ↵	
Read matrix name (location)	Esc CN ←	X22 ↵	
Reset matrix name to factory default	Esc •CN ←	Ipn• X23 ↵	
Set time and date	Esc X24 CT ←	Ipt X24 ↵	
Read time and date	Esc CT ←	X25 ↵	
Set GMT offset	Esc X26 CZ ←	Ipz X26 ↵	In the command, the divider between hours and minutes can be either a colon (:) or a period. In the response, the divider is a colon.
Read GMT offset	Esc CZ ←	X26 ↵	
Set Daylight Savings Time	Esc X27 CX ←	Ipx X27 ↵	Set the switcher to display the local time as Daylight Savings Time (+1 hour) in summer months.
Read Daylight Savings Time	Esc CX ←	X27 ↵	
Set IP address	Esc X28 CI ←	Ipi X28 ↵	
Read IP address	Esc CI ←	X28 ↵	
Read hardware address	Esc CH ←	X29 ↵	
Read number of open connections	Esc CC ←	X30 ↵	
Set subnet mask	Esc X28 CS ←	Ips X28 ↵	
Read subnet mask	Esc CS ←	X28 ↵	
Set gateway IP address	Esc X28 CG ←	Ipg X28 ↵	
Read gateway IP address	Esc CG ←	X28 ↵	
Set administrator password	Esc X31 CA ←	Ipa• X31 ↵	
Read administrator password	Esc CA ←	X31 ↵	
Reset (clear) administrator password	Esc •CA ←	Ipa• X31 ↵	
Set user password	Esc X31 CU ←	Ipu• X31 ↵	
Read user password	Esc CU ←	X31 ↵	
Reset (clear) user password	Esc •CU ←	Ipu• X31 ↵	
Set DHCP on or off	Esc X32 DH ←	Idh X32 ↵	When DHCP changes from on to off, the IP address resets to its default value, 192.168.254.254.
Read DHCP status	Esc DH ←	X32 ↵	
Set serial port parameters	Esc X33 *X34 , X35 , X36 , X37 CP ←	X34 , X35 , X36 , X37 ↵	
Read serial port parameters	Esc X33 CP ←	Cpn X33 •Ccp X34 , X35 , X36 , X37 ↵	
Set verbose mode	Esc X38 CV ←	Vrb X38 ↵	
Read verbose mode	Esc CV ←	X38 ↵	
Read security level of the connection	Esc CK	X39 ↵	
Configure current port timeout	Esc 0* X40 TC ←	Pti0* X40 ↵	
Read current port timeout	Esc 0TC ←	X40 ↵	
Configure global IP port timeout	Esc 1* X40 TC ←	Pti1* X40 ↵	
Read global IP port timeout	Esc 1TC ←	X40 ↵	

Special Characters

The HTML language reserves certain characters for specific functions. The switcher does not accept these characters as part of preset names, the name of the switcher, passwords, or locally created file names.

The switcher rejects the following characters or they are not recommended: {space (spaces **are** ok for names)} + ~ , @ = ‘ [ ] { } < > ’ “ semicolon (;) colon (:) | \ and ?.

Matrix Software

This section introduces the Extron Matrix Switchers Control Program software that is included with the MPX 866 A Media Presentation Matrix Switcher switchers, including:

- **Matrix Switchers Control Program**
- **Button Label Generator**

Matrix Switchers Control Program

The Matrix Switchers Control Program communicates with the switcher via the Ethernet LAN port or either serial port to provide an easy way to set up ties and sets of ties. The program is compatible with Windows 2000, Windows XP, Windows 7, and newer operating systems. Updates to the program can be downloaded from the Extron website (**www.extron.com**).

Installing the Software

The program is contained on the Extron Software Products DVD. Install the software as follows:

NOTE: For full functionality, install both of the following programs:
- The Matrix Switchers Control Program
- The Firmware Loader

1. Insert the DVD into the drive. The Extron software DVD window should appear automatically (see figure 30).

Extron Software CD - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address D:\index.html
Extron Electronics
Extron Software DVD Edition 2010.2
800.633.9876
Products
Software
Manuals
<click to select product>
Extron Software DVD Edition 2010.2
Extron Electronics, headquartered in Anaheim, California, is a leading manufacturer of professional A/V system integration products including A/V control systems, computer-video interfaces, switchers, matrix switchers, distribution amplifiers, audio amplifiers, speakers, twisted pair and fiber optic equipment, video scalers, A/V signal processors, classroom sound field systems, and high resolution cable. Extron offers solutions for integration of video and audio into presentation systems for a variety of environments, such as boardrooms, classrooms and training centers, lecture halls, command and control centers, and more.
Products
Find a product, and view available files.
Software
Install control and configuration software.
Done
My Computer

Figure 30. Software DVD Window

NOTE: If the window does not self-open, run Launch.exe from the DVD.

2. Click the **Software** tab (see figure 30).

3. Scroll to the desired program and click **Install** (see figure 31).

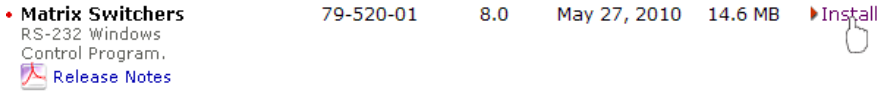


Figure 31. Software Installation

4. Follow the on-screen instructions. By default, the installation of the Matrix Switchers Control Program creates a `C:\Program Files\Extron\Matrix_Switchers` directory, and it places the following four icons into a group folder named "`Extron Electronics\Matrix Switchers:`"

   - MATRIX Switcher + Control Program
   - MATRIX Switcher + Help
   - Check for Matrix Updates
   - Uninstall MATRIX Switcher

Software operation via a serial port

The MPX 866 A matrix switcher can support remote control via any of three RS-232 serial ports:

- Two (Primary and Secondary) **rear panel RS-232 ports** on 3-pin captive screw connectors
- The **front panel Configuration (RS-232) port**, a 2.5 mm mini stereo jack

The default protocol for all ports is as follows:

- 9600 baud
- no parity
- 8 data bits
- 1 stop bit
- no flow control

Besides the default 9600 baud, the RS-232 ports can be configured to operate at the 19200, 38400, or 115200 baud rate.

See the **Serial port parameters SIS commands** on page 73 to configure all serial port using an SIS command.

Software operation via Ethernet

When the matrix switcher is connected to an Ethernet WAN or LAN, up to 200 users can operate it, locally or remotely, using the Matrix Switchers Control Program.
See "**Ethernet Connection**" for installation details.

Connection to the switcher via the Ethernet is password protected. There are two levels of password protection: administrator and user. Administrators have full access to all switching capabilities and editing functions. Users can select inputs and outputs, recall presets, and view all settings with the exception of passwords. If the same password or no password is required for logging on, all personnel log on with administrator privileges. Fields and functions that exceed user privileges are not selectable in the Matrix Switchers Control Program when the operator is logged on as a user.

The IP Settings/Options window (see **figure 36** on page 79) provides a location for viewing and, if the PC is connected via the RS-232 link or if you are logged on via the Ethernet port as an administrator, editing settings unique to the Ethernet interface.

Using the Matrix Switcher Control Software

Many items found in the Matrix Switchers Control Program are also accessible front panel controls (see the"**Operation**" section) and under SIS control (see the "**Programming Guide**" section). The Matrix Switcher + Help Program provides information on settings and on how to use the control program, itself.

1. To run the Matrix Switchers Control Program, click **Start** > **Programs** > **Extron Electronics** > **Matrix Switchers** > **MATRIX Switcher + Control Pgm**.

   The **Comm Port Selection** window (see figure 32) appears.

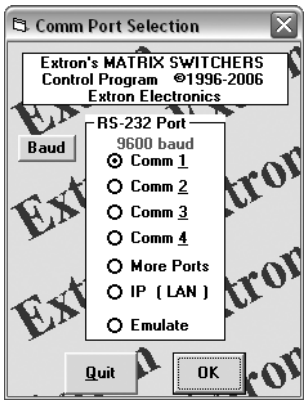
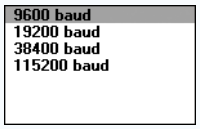


Figure 32. Comm Port Selection Window

2. Choose either the comm port that is connected to the RS-232 ports of the matrix switcher, **IP [LAN]**, or **Emulate**.

   - **If you selected a comm port**, check the baud rate displayed in the comm port selection window. Available rates are 9600, 19200, 38400, and 115200. The default is 9600.

     NOTE: If you need to change the baud rate, click the **Baud** button and double-click the desired baud rate.

     Click **OK**. The Extron Matrix Switchers Control Program window (see **figure 34** and **figure 35**) appears, displaying the current configuration of the attached matrix. Proceed to step **4**.

   - **If you selected IP [LAN]**, click **OK** and proceed to step **3**.
   - **If you selected Emulate**, click **OK** and see "**Using Emulation Mode**" on page 93.

3. **If you selected `IP [LAN]` in step 2**, the **`IP Connection`** dialog box appears (see figure 33).

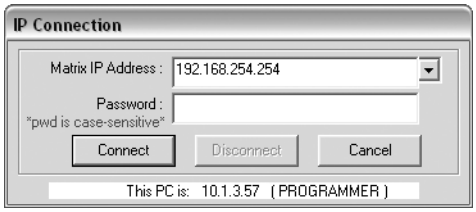


Figure 33. Address and Password Entry

a. Examine the Matrix IP Address field in the IP Connection window. The field displays the last Extron IP address entered.

   If the IP address is correct, proceed to step **3b**.

   If the address is not correct, either click in the **`Extron IP Address`** field and enter the IP address or click the scroll down button (▾) and select from among the recently used addresses. Proceed to step **3b**.

   NOTE: If the local system administrators have not changed the value, the factory-specified default, 192.168.254.254, is the correct value for this field.

b. If the switcher is password protected, click in the **`Password`** field and enter the appropriate administrator or user password.

c. Click **`Connect`**.

   - If you logged on using the administrator password or if no password was required, the program connects you to the matrix switcher with all of the administrator rights and privileges. The Extron `Matrix Switchers Control Program` window (see figure 34 and figure 35) appears, displaying the current configuration of the attached matrix. Proceed to step **4**.
   - If you logged on using the user password, the program connects you to the matrix switcher with only user capabilities.
   - If an incorrect password was entered, the computer beeps and the program returns to the password entry display.

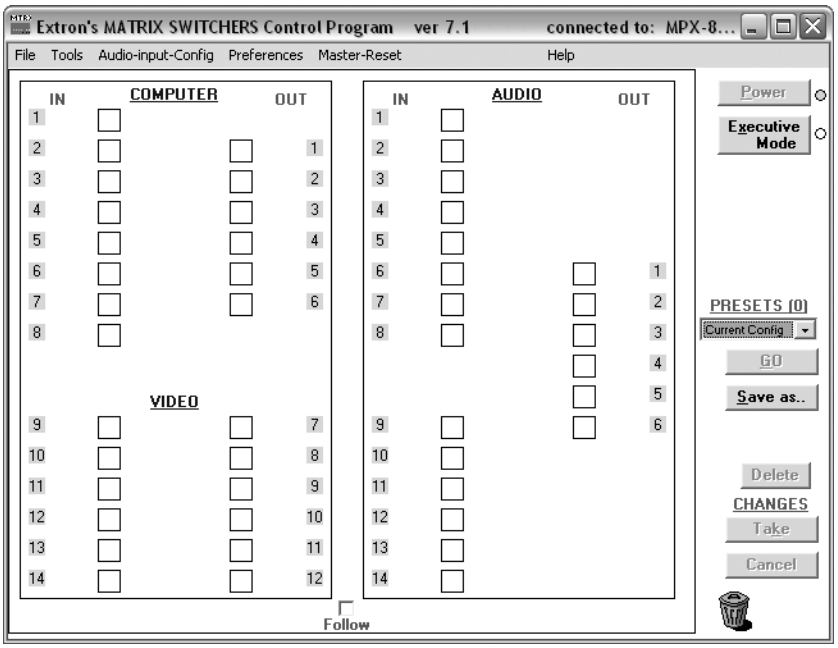


Figure 34. Extron Matrix Switchers Control Program Window (Blank)

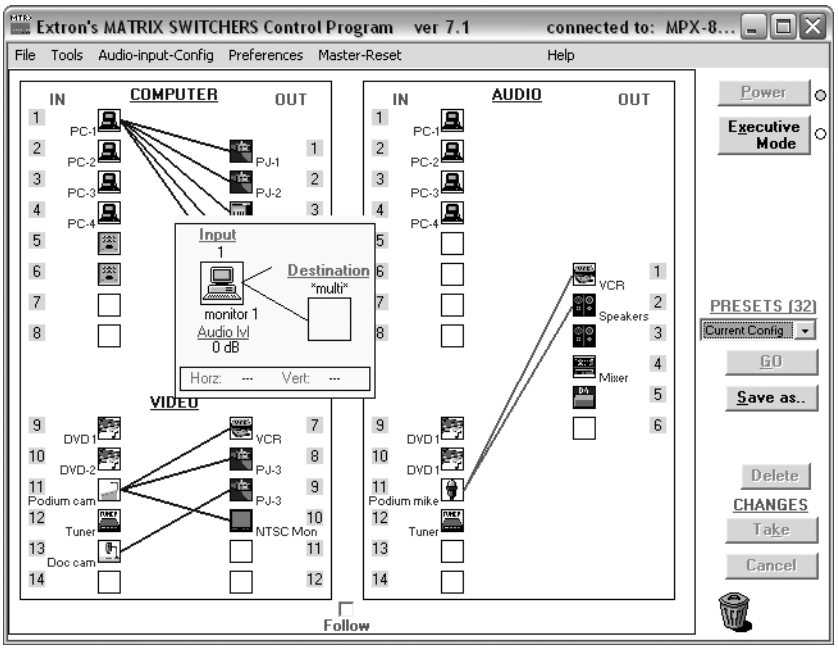


Figure 35. Sample Program Window (Complete)

4.
   - To create a tie, drag an input box to one or more output boxes. To remove a tie, drag the output box to its tied input box or to the trash can.
   - To make the control program easier to use, assign a device icon to each input and output. Click on a box that represents an input or output, and drag the desired icon onto the box from the icon palette that appears.
   - For quick display of information on a specific input or output device, position the pointer tool over that input or output in the control program window. The program opens a pop-up window that details the connections to that device and the status of the optical link (present or missing) input from or output to that device (see the inset box in figure 35).

   TIP: You can print a map of the current configuration by clicking **`File`** > **`Print Tie Map`**.

IP Settings/Options window

The `IP Settings/Options` window (see figure 36), accessible via the **`Tools`** menu, provides a location for viewing and, if connected via either serial port or if logged on via the Ethernet port as an administrator, editing settings unique to the Ethernet interface. See "**Ethernet Connection**" for basic information about IP addresses. None of the fields on this screen can be edited while you are logged on as a user.

Figure 36. Control Program IP Setting/Options Window

NOTES:
- Editing variables in the `IP Settings/Options` window while connected via the Ethernet port can immediately disconnect the user from the switcher. Extron recommends editing the settings on this screen using the RS-232 link and protecting the Ethernet access to this screen by assigning an administrator'password to qualified and knowledgeable personnel only.
- When the control program is connected to the switcher via the RS-232 link, the `Administrator Password` and `User Password` fields are not masked. If a password has been inadvertently changed to an unknown value, you can look up and, if desired, change a password in this window without knowing the current password.

Address and Name fields

The **`Matrix IP Address`** field contains the IP address of the connected matrix switcher. This value is encoded in the flash memory in the switcher.

The **`Gateway IP Address`** field identifies the address of the gateway to the controlling PC to be used if the matrix switcher and the mail server are not on the same subnet.

The **`Subnet Mask`** field is used to determine whether the matrix switcher is on the same subnet as the controlling PC when you are subnetting (see "**Subnetting — A Primer**").

Valid addresses consist of four 1-, 2-, or 3-digit numeric subfields, properly called "octets," separated by dots (periods). Each field can be numbered from 000 through 255. Leading zeroes, up to three digits total per field, are optional. Values of 256 and above are invalid.

The default addresses are as follows, but if these conflict with other equipment at your installation, you can change the addresses to any valid value:

- IP address 192.168.254.254
- Subnet mask 255.255.0.0
- Gateway address 0.0.0.0

NOTES:
- The address fields are grayed out and uneditable when DHCP is selected.
- Editing the addresses while connected via the Ethernet port can immediately disconnect the user from the MPX 866 A matrix switcher. Extron recommends editing this field using one of the serial ports and protecting the Ethernet access by assigning an administrator password to qualified and knowledgeable personnel only.

The **Extron Name/Descriptor** field contains the name of the matrix switcher. This descriptor can be changed to any valid name, up to 24 alphanumeric characters.

NOTE: The following characters are invalid or not recommended in the Extron Name/Descriptor field:
{space} + ~ , @ = ‘ [ ] { } < > ’ “ ” ; : | \ and ?.

Edit any of these fields as follows:

1. Click in the desired field. The graphic cursor becomes a text cursor.
2. Edit the address or name as desired.
3. Press the <Tab> key on the keyboard or click in another field to exit the field.
4. Click the **Take** button to make the address change take affect.

Hardware Address field

The hardware (MAC) address is hardcoded in the matrix switcher and cannot be changed.

Use DHCP check box

The **Use DHCP** check box directs the matrix switcher to ignore any entered IP addresses and to obtain its IP address from a Dynamic Host Configuration Protocol (DHCP) server (if the network is DHCP capable). Contact the local system administrator to determine whether to use DHCP.

Date, Time (local), and GMT (offset) fields

The **Date** field displays the current date in the Greenwich Mean Time zone.

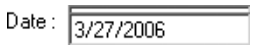
The **Time (local)** field displays the current time in the local time zone.

The **GMT** field displays the amount of time, in hours and minutes, that the local time varies from the GMT international time reference.

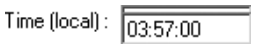
NOTE: Rather than the following procedure, you can click the **Sync Time to PC** button to set the switcher to the internal time of your computer.

If desired, adjust any of these values as follows:

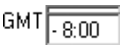
1. Click in the desired field. The field changes to an editable field appropriate to the value being change and the graphic cursor becomes a text cursor.
   - The **Date** field becomes a set date field, with the date in the format (M)M/(D)D/YYYY. Leading zeroes are not shown.

   - The **Time (local)** field becomes a set time field, with the time in the format HH:MM:SS (00:00:00 to 23:59:59).

   - The **GMT** field becomes a set offset field, with the offset in the format ±HH:MM (–12:00 to +14:00).

2. Edit the field as desired to set the proper value. For time, remember to use 24-hour time. Leading zeroes are optional.
3. Press the <Tab> key on the keyboard or click in another field to exit the set date field.
4. Click the **Take** button to make the date change take affect.

Sync Time to PC button

Clicking the **Sync Time to PC** button causes the computer you are operating to send its internal time to the switcher in a set time command.

Use Daylight Savings check box

If desired, click in the **Use Daylight Savings** check box. When Daylight Saving Time is turned on, the switcher automatically updates its internal clock between Standard Time and Daylight Saving Time in the spring and fall on the date that the time change occurs in the country or region selected. When Daylight Saving Time is turned off, the switcher does not adjust its time reference.

NOTE: For Daylight Saving Time in Europe and Brazil, see the **Set Daylight Saving Time** SIS command on page 73.

Administrator Password and User Password fields

The **Administrator Password** field displays the password required to log on to the matrix switcher via the Ethernet port with all of the rights and privileges of an administrator. The **User Password** field displays the password required to log on to the matrix switcher via the Ethernet port as a user, without all of the rights and privileges of an administrator. Passwords are case sensitive and are limited to 12 upper-case and lower-case alphanumeric characters.

While you are logged on as a user, both password fields are masked with asterisks (****************) as a security measure.

NOTES:
- Editing the **Administrator Password** field while connected via the Ethernet port can immediately disconnect the user from the switcher. Extron recommends editing this field using one of the serial ports and protecting the Ethernet access to this screen by assigning an administrator password to qualified and knowledgeable personnel only.
- An administrator password must be created before a user password can be created.
- The following characters are invalid or not recommended in passwords: {space} + ~ , @ = ‘ [ ] { } < > ’ “ ” ; : | \ and ?.

Edit either password field as follows:

1. Click in the desired **Password** field. The pointer tool becomes a text cursor.
2. Edit the case-sensitive password as desired.
3. Press the <Tab> key on the keyboard or click in another field to exit the **Password** field.
4. Click the **Take** button to make the password change take effect.

Updating firmware

The firmware upgrade utility provides a way to replace the firmware that is coded on the control board of the switcher without taking the switcher out of service.

Update the switcher firmware as follows:

1. Visit the Extron website, **www.extron.com**, click the **Download** tab, and then click the **Firmware** link (see figure 37).

NOTE: The version, release date, and size shown are sample values only.

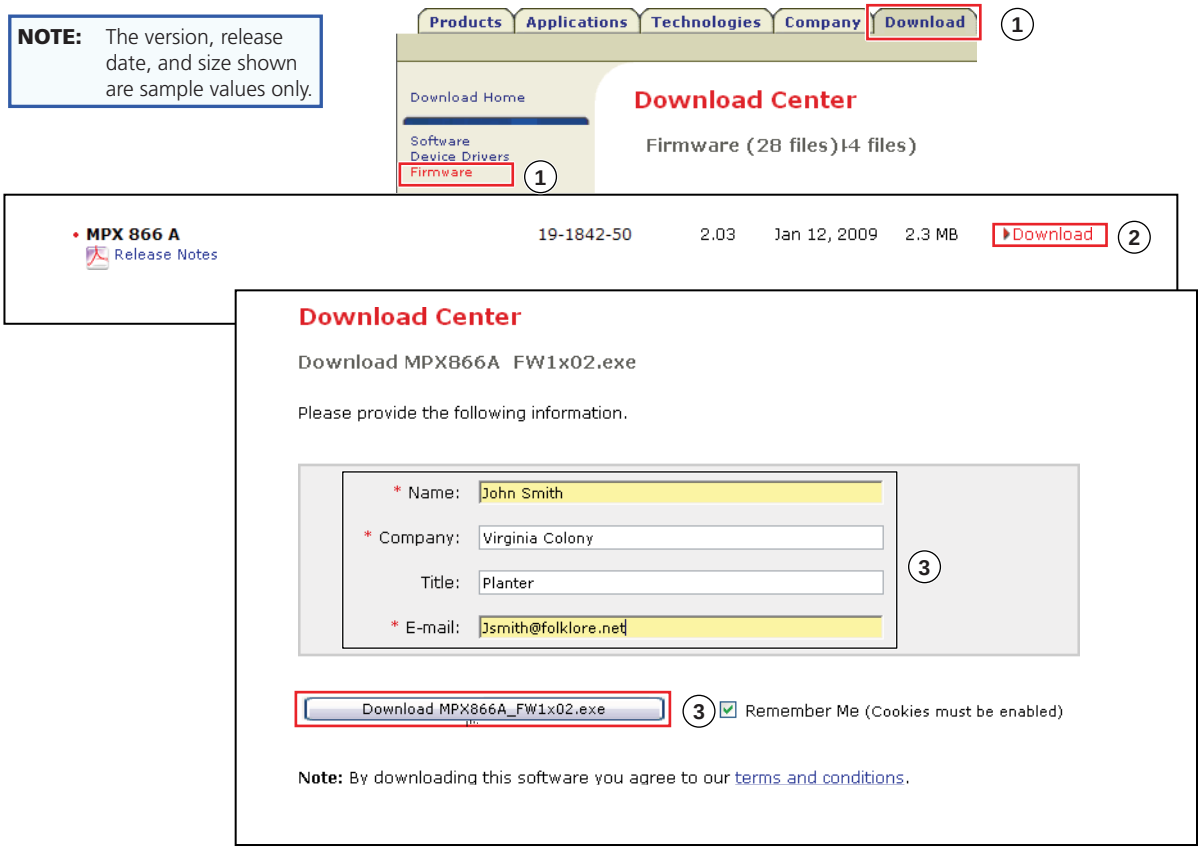
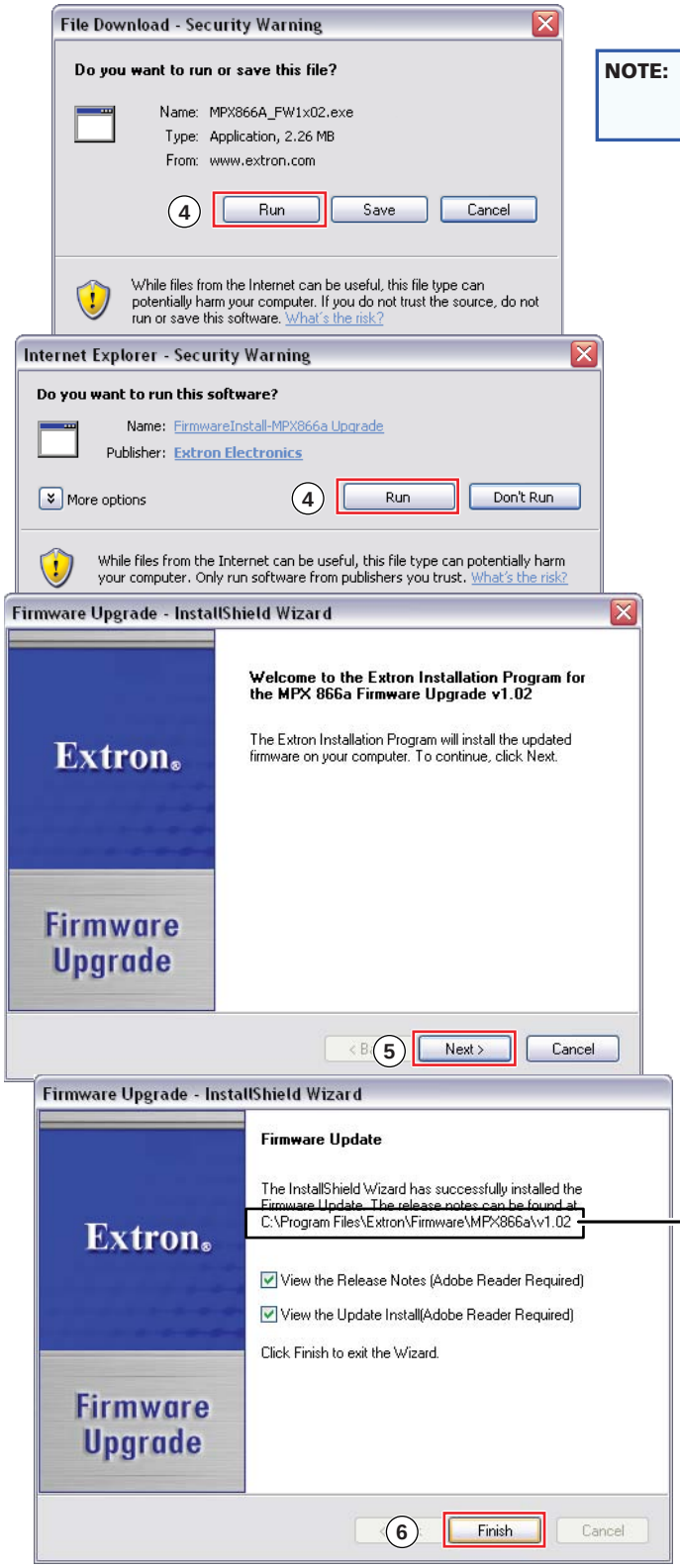


Figure 37. Location of Firmware Upgrade Files

2. Select the appropriate firmware file (MPX 866 A) to download and click **Download**.
3. Enter the requested personal information and then click **Download** to copy the firmware to your computer.
4. Click **Run** on the next two screens (see **figure 38** on the next page). The PC downloads the firmware update from the Extron website and starts the Extron Installation Program to extract the firmware file.
5. Click **Next**. The program extracts the firmware files and places them in a folder identified in the InstallShield Wizard window.

   NOTE: Note the folder to which the firmware file is saved.

6. Click **Finish** to exit the program.


File Download - Security Warning
Do you want to run or save this file?
Name: MPX866A_FW1x02.exe
Type: Application, 2.26 MB
From: www.extron.com
4
Run
Save
Cancel
While files from the Internet can be useful, this file type can potentially harm your computer. If you do not trust the source, do not run or save this software. What's the risk?
Internet Explorer - Security Warning
Do you want to run this software?
Name: FirmwareInstall-MPX866a Upgrade
Publisher: Extron Electronics
More options
4
Run
Don't Run
While files from the Internet can be useful, this file type can potentially harm your computer. Only run software from publishers you trust. What's the risk?
Firmware Upgrade - InstallShield Wizard
Extron
Firmware Upgrade
Welcome to the Extron Installation Program for the MPX 866a Firmware Upgrade v1.02
The Extron Installation Program will install the updated firmware on your computer. To continue, click Next.
5
Next >
Cancel
Firmware Upgrade - InstallShield Wizard
Extron
Firmware Upgrade
Firmware Update
The InstallShield Wizard has successfully installed the Firmware Update. The release notes can be found at C:\Program Files\Extron\Firmware\MPX866a\v1.02
View the Release Notes (Adobe Reader Required)
View the Update Install(Adobe Reader Required)
Click Finish to exit the Wizard.
6
Finish
Cancel
Folder where firmware is installed

NOTE: The version shown is a sample values only.

Figure 38. Downloading Firmware Upgrade Files

7. Connect a computer that runs the Windows operating system to either switcher serial port or the switcher LAN port. See "**Installation**" for more details.

8. Start the Matrix Switchers Control Program and connect to the matrix switcher. See "**Using the Matrix Switcher Control Software**," steps **1** through **4**, starting on page 76.

9. Click **Tools** > **Update** firmware.

   - **If the switcher is connected via the LAN port**, the `Select Files` dialog box appears (see figure 39). See Ethernet-connected firmware upload, below.
   - **If the switcher is connected via either serial port**, the `Extron Firmware Loader` appears (see figure 40 and "**Serial-port-connected firmware upload**," on the next page).

NOTES:
- Valid firmware files must have the file extension .S19. A file with any other extension is not a firmware upgrade.
- The original factory-installed firmware is permanently available on the MPX 866 A matrix switcher. If the attempted firmware upload fails for any reason, the switcher reverts to the factory-installed firmware.

Ethernet-connected firmware upload

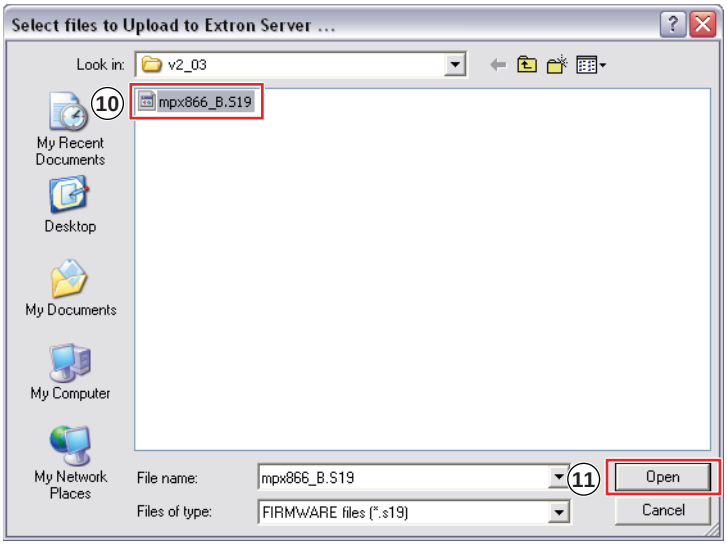


Figure 39. Select Files Window Dialog Box

10. Navigate to the folder where you saved the firmware upgrade file. Select the file.

11. Click the **Open** button. The software advises you that you are about to reprogram the switcher firmware. Click **OK** to continue.

    A status window, which shows the progress of the upload, appears. The firmware upload to the MPX 866 A matrix switcher may take a few minutes.

Serial-port-connected firmware upload

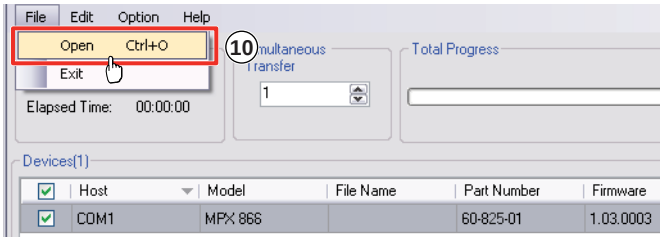


Figure 40. Extron Firmware Loader Window

10. Select the MPX 866 A matrix switcher and click **`File`** > **`Open`**. The `Choose Firmware File` screen appears (see figure 41).

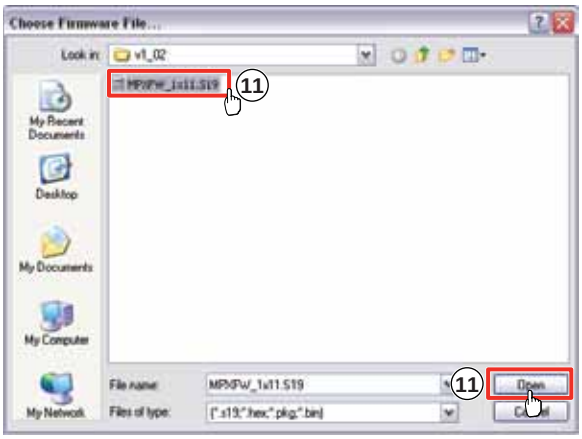


Figure 41. Choose Firmware File Window

11. Navigate to and select the new firmware file. Click **`Open`**. The Choose Firmware File window closes.

> **CAUTION:** The firmware file must have an .s19 extension. Other file types can cause the switcher to stop functioning.

> **NOTE:** When downloaded from the Extron website, the firmware is placed in a subfolder of `C:\Program Files\Extron\Firmware`.

12. In the Firmware Loader window, click **`Begin`** (see figure 42).

The `Total Progress` and `Progress` status bars show the upload progress. The firmware upload may take several minutes. Once the status bars have progressed from `0%` to `100%`, and Status is listed as `Completed`, the firmware loader utility resets the switcher.

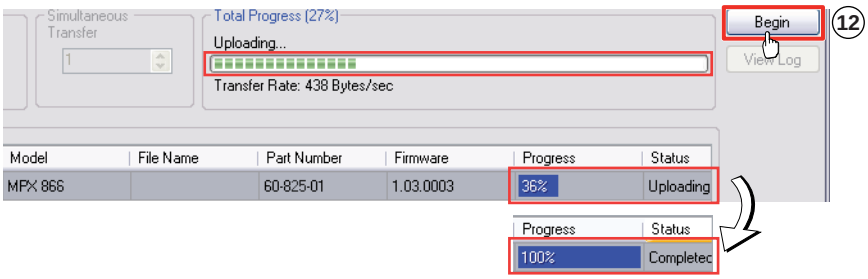


Figure 42. Firmware Loader Screen

13. Click **`Exit`** to close the Firmware Loader.

Uploading HTML files

You can create customized HTML pages for the switcher to display. The `HTML Files List` window (see figure 43), accessible via the **`Tools`** menu, provides a way to view the contents of the file system of the switcher and upload custom HTML pages to the switcher.

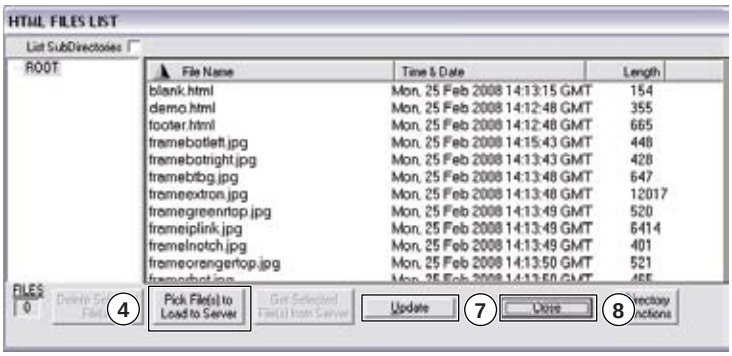


Figure 43. HTML Files List Window

Upload HTML pages as follows:

NOTES:
- The files listed in figure 43 are shown for example only and may not be present on your switcher.
- The HTML Files List window is for inserting your own HTML pages. This is not the window to replace the firmware that controls all switcher operation. See "**Updating firmware,**" to replace the firmware.
- The following characters are invalid or not recommended in file names: {space} + ~ , @ = ‘ [ ] { } < > ’ “ ” ; : | \ and ?.

1. Connect the PC to the matrix switcher via any of the serial ports or the Ethernet port of the switcher.
2. Start the Matrix Switchers Control Program and connect to the MPX 866 A matrix switcher. See "**Using the Matrix Switcher Control Software**," steps **1** through **4**, starting on page 76.
3. Click **`Tools`** > **`HTML File Manager`**.
4. Click the **`Pick File(s) to Load to Server`** button. An `Open File` window appears.
5. Navigate to the folder where you saved the HTML file of files. Select the files.

   NOTES:
   - To select multiple files, hold the Ctrl key while you select the desired files.
   - If you want one of the HTML files that you created to be the default start-up page, name the file "index.html". The MPX 866 A matrix switcher automatically looks for that file name when you first connect to it using an Internet browser.

6. Click the **`Open`** button. Uploading the files to the MPX 866 A matrix switcher may take a few minutes.
7. Click the **`Update`** button to confirm the upload.
8. Click the **`Close`** button to exit the HTML Files List window.

Windows Buttons, Drop Boxes, and trash can

The buttons, drop boxes, and trash can on the right side of the **Matrix Switchers Control Program** window perform the following functions:

Power — Unavailable for MPX 866 A switchers, because the switcher power cannot be controlled via software.

Executive Mode — Allows you to lock out front panel operations, except for the view-only mode functions. Click the button to cycle between Lock mode 0 (the indicator displays white), Lock mode 1 (the indicator displays red), and Lock mode 2 (the indicator displays orange).

> **NOTE:** See "**Setting the Front Panel Locks (Executive Modes)**" in the "Operation" section for more information on the Lock modes.

Presets menu — Displays a list of up to 32 global presets. You can select a preset from the list to display it in the window and either activate it (**Go**) or delete it (**Delete**).

Go — Activates the selected preset as the current configuration.

Save as ... — Allows the current set of ties to be saved as a preset. Enter the preset number when prompted to do so.

Delete — Allows the current preset to be deleted.

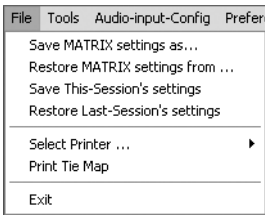
Changes – Take — Allows you to execute any potential changes made to the displayed configuration.

Changes – Cancel — Returns to the previous screen, undoing any changes you have made.

Trash can — Drag and drop from an input or output button to the trash can to erase all ties associated with that input or output.

Windows menus

File menu



Save Matrix settings as ... — Saves a complete set of up to 32 presets plus the last active setting (preset 0), to a file. Saved settings include assigned icons and icon captions.

Restore Matrix settings from ... — Loads and activates a previously saved setting file.

Save This-Session's settings — Saves the current assigned icons and icon captions.

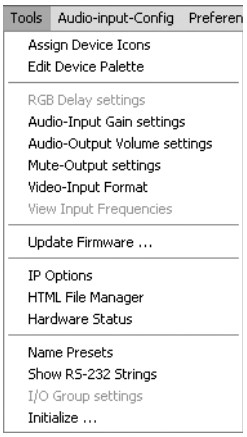
Restore Last-Session's settings — Loads the icons and icon captions that were saved during the last session. If you saved changes from the previous session to disk, the last time you exited the program, the ties from that session are also loaded.

Select printer — Selects the target printer.

Print tie map — Prints the tie set that is displayed on the screen.

Exit — Closes the Matrix Switchers Control Program.

Tools menu



`Assign Device Icons` — Displays the complete set of input and output device icons. You can drag any of these icons to the input and output boxes.

`Edit Device Palette` — Allows you to add your own device icon graphics.

`Audio-Input gain settings` — Displays the audio gain level setting for a single input or for all inputs and allows you to change it (see figure 44). The level is expressed as the magnitude (number of decibels) and polarity (positive, gain; or negative, attenuation) of the audio adjustment.

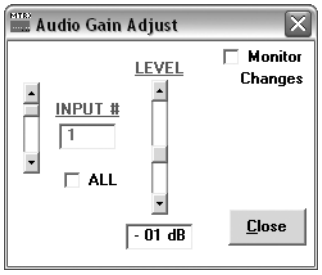


Figure 44. Audio Gain Adjust Dialog Box

`Audio-Output volume settings` — Displays the audio output level setting for a single input or for all inputs and allows you to change it (see figure 45). The level is expressed as a percentage of the input audio volume that is applied to the output; 0% is full attenuation (audio is silent), 100% is full volume.

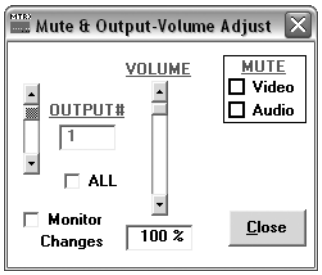


Figure 45. Mute and Output Volume Adjust Dialog Box

`Mute-Outputs settings` — Displays the `Mute Adjust` window (see figure 45), which allows you to mute and unmute the video and audio output for a single output or for all outputs. This window also displays the output volume level settings and allows you to change them.

`Video-Input Format` — Displays the Mute and Output Volume window (see figure 46), which allows you select the video format, S-video or composite video, for the four configurable inputs in the low resolution video group, input 11 through input 14.

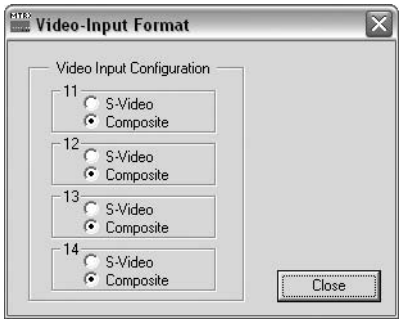


Figure 46. Video Input Format Dialog Box

Update Firmware — Allows you to replace the firmware .without taking the switcher out of service (see "**Updating Firmware**").

IP Options — Allows you to set IP options (see "**IP Settings/Options Window**").

HTML file manager — Displays a list of HTML files installed on the switcher and allows you to upload custom files from a connected PC to the switcher.
See "**Uploading HTML Files**" on page 87.

Hardware status — Provides an overall view of the status of the matrix switcher, including the power supply voltages, the internal temperature, the RS-232 port configuration, and the installed and updated firmware status (see figure 47).

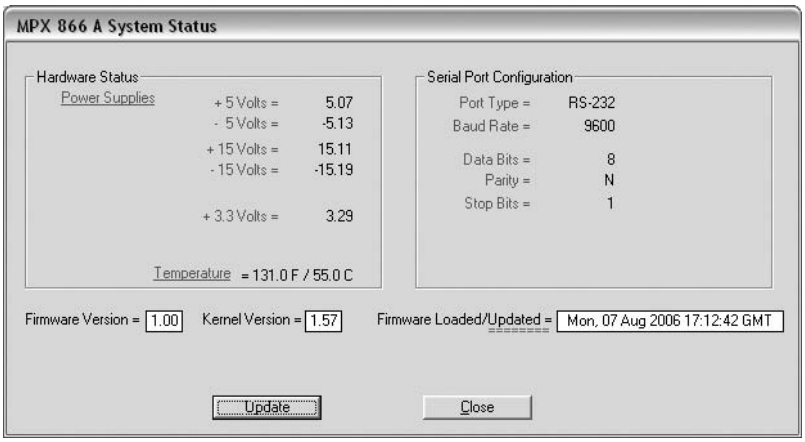

MPX 866 A System Status
Hardware Status
Power Supplies
+ 5 Volts = 5.07
- 5 Volts = -5.13
+ 15 Volts = 15.11
- 15 Volts = -15.19
+ 3.3 Volts = 3.29
Temperature = 131.0 F / 55.0 C
Serial Port Configuration
Port Type = RS-232
Baud Rate = 9600
Data Bits = 8
Parity = N
Stop Bits = 1
Firmware Version = 1.00
Kernel Version = 1.57
Firmware Loaded/Updated = Mon, 07 Aug 2006 17:12:42 GMT
Update
Close

Figure 47. Status Window

Name Presets — Allows you to assign a name to each of the 32 global presets.

NOTES:
- Preset names are limited to 12 upper- and lower-case alphanumeric characters.
- The following characters are invalid or not recommended in preset names: + ~ , @ = ' [ ] { } < > ' " ; : | \ and ?.

Show RS-232 Strings — Displays the ASCII commands that are used by the current configuration. You can see these for SIS programming.

Initialize — Initializes and clears any or all of the following: ties, presets, audio configuration, preset names, icon names, and icons.

Audio Input Configuration selection

Audio-input-Config

Displays the Configure Audio Options window, which allows you to make audio input gain and attenuation adjustments to all inputs, either individually or all at once, from one window (see figure 48).

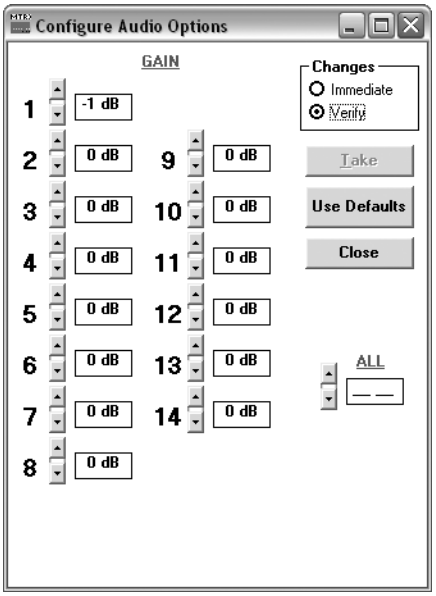
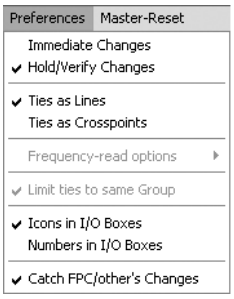


Figure 48. Configure Audio Options Dialog Box

Preferences menu



`Immediate Changes` — Causes configuration changes to take effect immediately.

`Hold/verify Changes` — Delays implementation of configuration changes until the Changes – **`Take`** button is pressed.

`Ties as Lines` — Displays ties as lines (see figure 49).

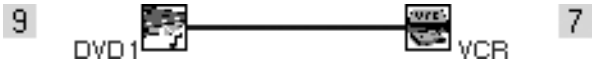


Figure 49. Ties Shown as Lines

Ties as Crosspoints — Displays ties as a matrix of inputs and outputs (see figure 50). Ties that have been made are indicated as amber or green boxes. Ties that will take effect when you click the **Take** button are indicated by +. Ties that will be broken when you click the **Take** button are indicated by –.

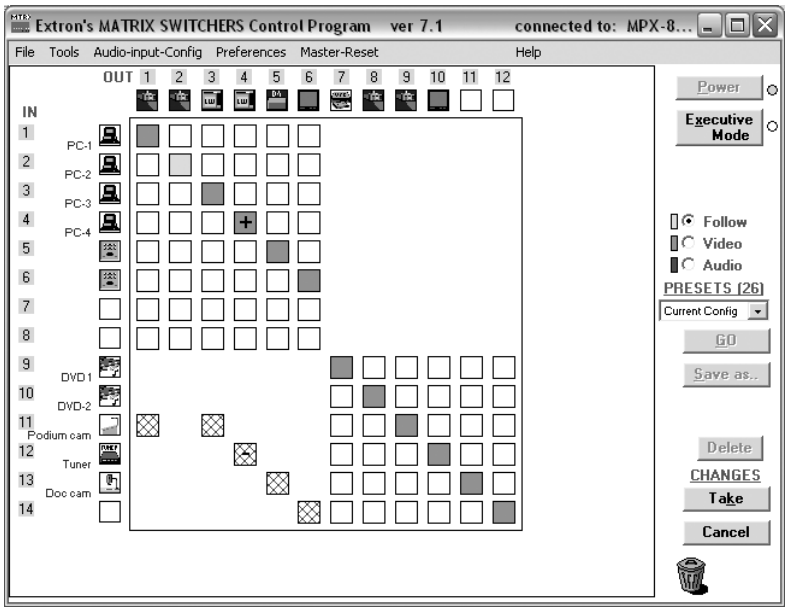
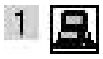


Figure 50. Ties Shown as Crosspoints

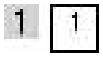
NOTES:

- Video ties can only be made **within** the following groups, never **between** the groups:
  - The computer video group (inputs 1 through 8 and outputs 1 through 6)
  - The low resolution video group (inputs 9 through 14 and outputs 7 through 12)
- Audio can be tied only to outputs 1 through 6. If you make a video and audio tie from the low resolution video group (inputs 9 through 14), audio is automatically redirected to tie it and output in the computer subgroup (outputs 1 through 6).
- See "**Creating a Configuration**," on page 24 to identify the outputs to which audio inputs are tied.
- When audio is broken away between groups, the audio tie is shown in crosshatched red boxes (⊠).

Icons in I/O Boxes — Erases any numbers in the I/O boxes in the `Control Program` window (see **figure 34**). You can place icons in the boxes.



Numbers in I/O Boxes — Erases any icons in the I/O boxes in the Control Program window and fills each box with the associated input or output number.



Catch FPC/others changes — When checked, sets the switcher to report all configuration and setting changes to the serial port or Ethernet connection that turned this selection on. These reports allow the Matrix Switchers Control Program to track the changes that occur in the configuration and settings of the switcher, whether commanded via the front panel, either serial port, or the Ethernet port.

Master-Reset selection

Master-Reset

Master reset performs all of the following functions:

- Clears all ties
- Clears all presets
- Clears all video and audio mutes
- Sets all input audio levels to unity gain (0 dB)
- Sets all output volume levels to 100% (0 dB of attenuation)

NOTE: Master reset does not reset the Internet protocol (IP) settings.

Using Emulation Mode

Emulation mode allows you to set up the software without connecting the switcher. Use emulation mode as follows:

1. Click **Start** > **Programs** > **Extron Electronics** > **Matrix Switchers** > **MATRIX Switcher + Control Pgm**.
2. Choose **Emulate**, and click **OK**.
3. Choose an emulation file to open, and click **OK**. The file DEMO.MTX provides a sample of a completed matrix setup. Selecting the file NEW.INI or clicking **Cancel** provides a blank setup window to get you started.
4. Enter the file name under which you want to save any changes to the file, and click **OK**.
5. Select **MPX 866** as the Matrix Model, **14 x 12** as the Video Planes; and **14 x 6** as the Audio Planes (see figure 51). Click **OK**.

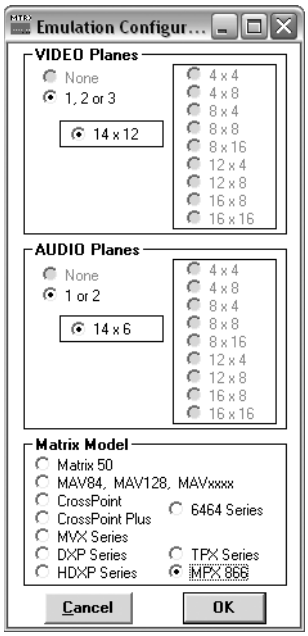


Figure 51. Emulate Configuration Dialog Box

6. Continue using the program as described on page 79.

Using the Help system

For information about program features, you can access the help program in any of the following ways:

- From the Extron Electronics program folder or group, double-click the MATRIX Switcher Help icon (shown at right).
- From within the Matrix Switchers Control Program, click **Help** > **Contents** on the menu bar.
- From within the Matrix Switchers Control Program, press the keyboard <F1> key.

Button-Label Generator Program

The Button Label Generator software creates labels that you can place in the translucent covers above and below the input and output pushbuttons. You can create labels with names, alphanumeric characters, or even color bitmaps for easy and intuitive input and output selection. See the "**Installation**" section for the procedure for removing and replacing the translucent covers.

The Extron Button Label Generator is available on the Extron website, **www.extron.com**, under the **Download** tab. Click the **Software** link (see figure 52), and download and install the program on your PC.

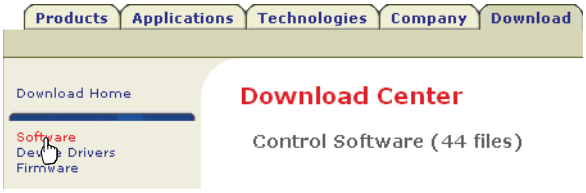


Figure 52. Location of Software on the Website

NOTE: The Button Label Generator software is also included on the Extron Software Products Disk that accompanied the switcher.

By default, the Windows installation creates a `C:\Program Files\Extron\ButtonLabelGenerator` directory and places the Button Label Generator icon into a group or folder named "`Extron Electronics`."

Using the Button-Label Generator Software

1. To run the Button-Label Generator program, click **Start** > **Programs** > **Extron Electronics** > **Button Label Generator** > **Button Label Generator**. The **Button-Label Generator** window appears (see figure 53).

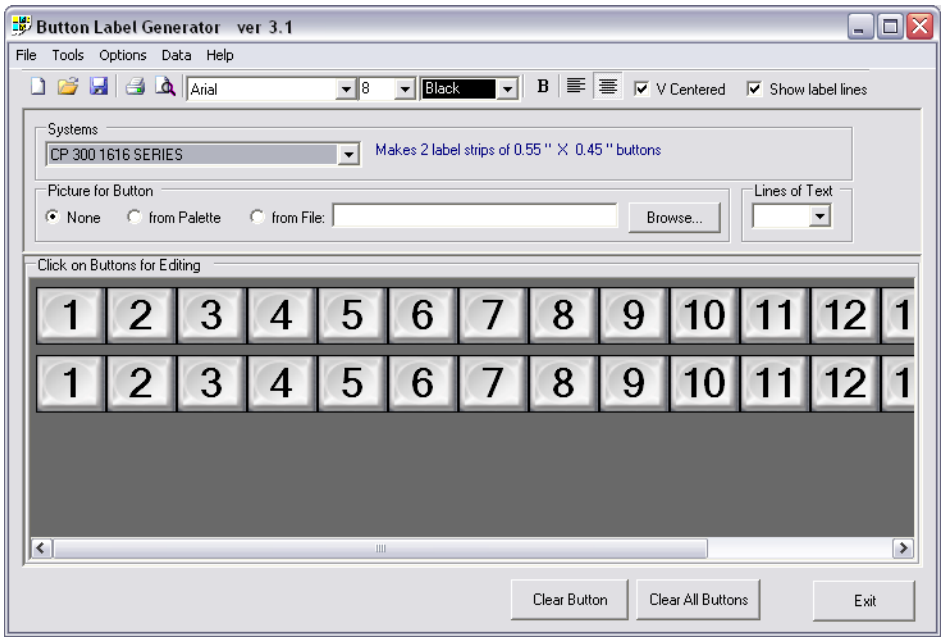


Figure 53. Extron Button-Label Generator Window

2. In the Systems selection box, choose the **CP 300 1616 Series** option to match the label strip size for your MPX 866 switcher.

   NOTE: You will need to trim excess label positions with scissors.

3. Using normal Windows controls, you can create and print labels that can be placed in the label windows on the front panel of the switcher.

   NOTE: For best results, print on transparent or translucent material.

4. Click the **Clear All Buttons** button and create new labels as many times as necessary to make all of the button labels that you need.

   To access the help program, click the **Help** menu.

HTML Operation

This section describes the operation of the MPX 866 A matrix switcher, including:

- Opening the Embedded Web Pages
- Status Tab
- Configuration Tab
- File Management Tab
- Control Tab
- Special Characters

The switcher can be controlled and operated through its LAN port, connected via a LAN or WAN, using a web browser such as Microsoft® Internet Explorer®. The browser display of the status or operation of the switcher has the appearance of web pages. This section describes the factory-installed HTML pages, which are always available and cannot be erased or overwritten.

NOTE: If your Ethernet connection to the matrix switcher is unstable, try turning off the proxy server in your web browser. In Internet Explorer, click **Tools** > **Internet Options** > **Connections** > **LAN Settings**, uncheck the **Use a proxy server...** box, and then click **OK**.

Opening the Embedded Web Pages

Access the switcher using HTML pages as follows:

1. Start the web browser program.
2. Click in the **Address** field of the browser and enter the Matrix IP address.

   NOTE: If the local system administrators have not changed the value, the factory-specified default, 192.168.254.254, is the correct value for this field.

3. If you want the browser to display a page other than the default page (such as a custom page that you have uploaded), enter a slash (/) and the name of the file to open.

   NOTES:
   - The **Address** field of the browser should display the address in the following format: *xxx.xxx.xxx.xxx*/{*optional_file_name.html*}.
   - The following characters are invalid or not recommended in file names: {space} + ~ , @ = ‘ [ ] { } < > ’ “ ” ; : | \ and ?.

4. Press the keyboard <Enter> key. The switcher checks to see if it is password protected.

   If the switcher is not password protected, it checks and downloads the HTML pages (proceed to step **7**).

   If the switcher is password protected, the switcher downloads the Enter Network Password page (see figure 54).

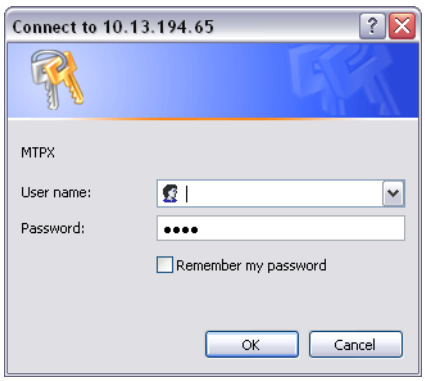


Figure 54. Enter Network Password Page

NOTE: A User name entry is not required.

5. Click in the Password field and type in the appropriate administrator or user password. Click the **OK** button.
6. The switcher checks several possibilities, in the following order, and then responds accordingly:
   - Does the address include a specific file name, such as 10.13.156.10/file_name.html? **If so**, the switcher downloads that HTML page.
   - Is there a file in the memory of the switcher that is named "index.html"? **If so**, the switcher downloads "index.html" as the default startup page.
   - **If neither of the above conditions is true**, the switcher downloads the factory-installed default startup page, "nortxe_index.html" (see figure 55), also known as the System Status page.

Status Tab

System Status Page

The System Status page (see figure 55) provides an overall view of the status of the matrix switcher, including individual voltages, power supply status, and fan status. The System Status page is the default page that the switcher downloads when you connect to the switcher. Access the System Status page from other pages by clicking the **Status** tab.

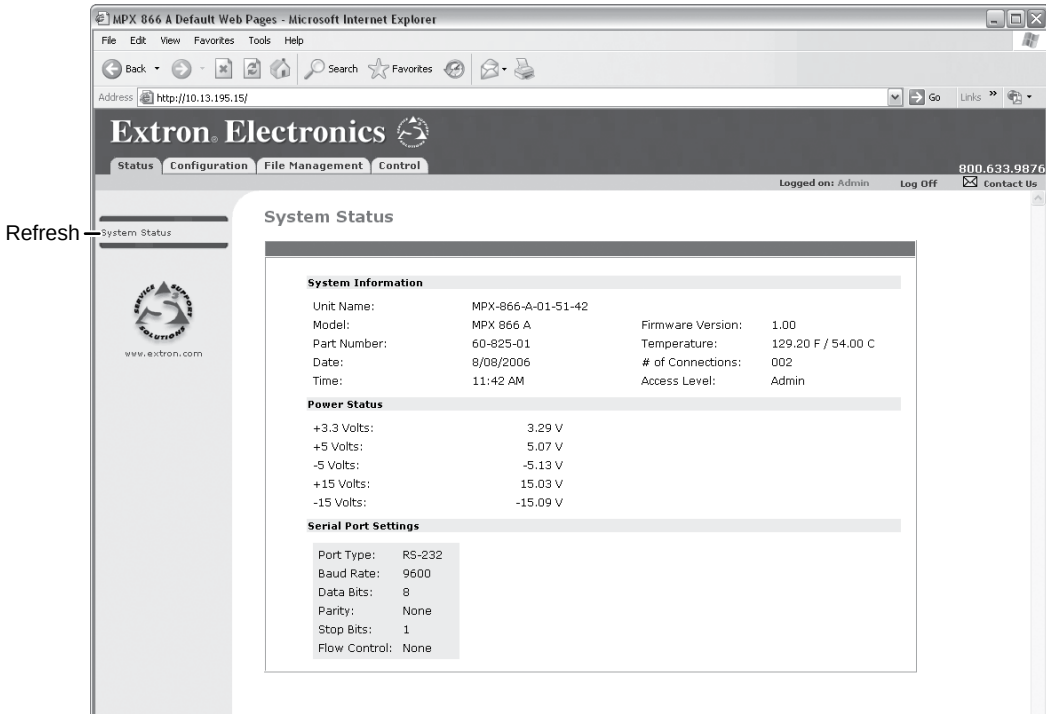


Figure 55. System Status Page

The status web page periodically updates itself to reflect the latest status of the switcher components. If a variable changes, the display shows the change the next time it updates.

Configuration Tab

System Settings Page

The MPX 866 A matrix switcher downloads the System Settings page (see figure 56) when you click the **Configuration** tab. The screen consists of fields in which you can view and edit IP administration and system settings. You can access the Passwords pages by clicking the appropriate link. See "**Ethernet Connection**" for basic information about IP addresses and subnetting.

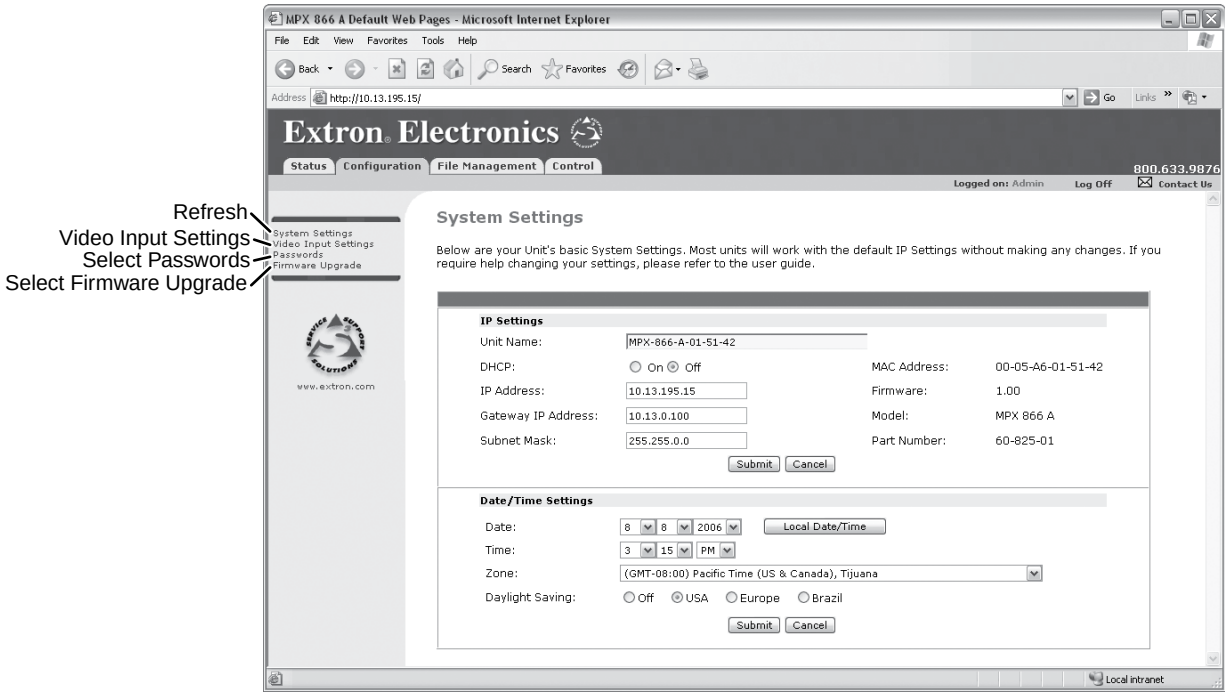


Figure 56. System Settings Page

On password-protected connections, there are two levels of protection: administrator and user. Administrators have full access to all switching capabilities and editing functions. Users can create ties, create and recall presets, set RGB and audio mutes, and view all settings with the exception of passwords.

IP Settings fields

The **IP Settings** fields provide a location for viewing and editing settings unique to the Ethernet interface. After editing any of the settings in this field, click the **Submit** button at the bottom of the field.

Unit Name field

The **Unit Name** field contains the name of the switcher. This name field can be changed to any valid name, up to 24 alphanumeric characters.

NOTE: The following characters are invalid or not recommended in the matrix name: + ~ , @ = ' [ ] { } < > ' " ; : | \ and ?.

DHCP radio buttons

The **DHCP On** radio button directs the switcher to ignore any entered IP addresses and to obtain its IP address from a Dynamic Host Configuration Protocol (DHCP) server (if the network is DHCP capable). The **DHCP Off** radio button turns DHCP off. Contact the local system administrator to determine if DHCP is appropriate.

NOTE: When you change DHCP from on to off, the IP address of the switcher resets to its default value, 192.168.254.254.

IP Address field

The **IP Address** field contains the IP address of the connected switcher. This value is encoded in the flash memory of the switcher.

Standard IP protocol consists of addresses comprised of four 1-, 2-, or 3-digit numeric subfields, properly called octets, separated by dots (periods). Each field can be numbered from 000 through 255. Leading zeroes, up to three digits total per field, are optional. Values of 256 and above are invalid.

The factory-installed default address is 192.168.254.254, but if this conflicts with other equipment at your installation, you can change the IP address to any valid value.

NOTE: IP address changes can cause conflicts with other equipment. Only local system administrators should change IP addresses.

Gateway IP Address field

The **Gateway IP Address** field identifies the address of the gateway to the mail server to be used if the switcher and the mail server are not on the same subnet. Standard IP protocol rules apply to the Gateway IP address.

Subnet Mask field

The **Subnet Mask** field is used to determine whether the switcher is on the same subnet as the mail server when you are subnetting. Standard IP protocol rules apply to the Gateway IP address. For more information, see "**Subnetting — A Primer**".

MAC Address

The Media Access Control (MAC) Address is hardcoded in the switcher and cannot be changed.

Firmware field

The **Firmware** field identifies the installed firmware version. This field is hardcoded in the switcher and cannot be changed.

Date/Time Settings fields

The **Date/Time Settings** fields (see figure 57) provide a location for viewing and setting the time functions.

Figure 57. Date/Time Settings Fields

Change the date and time settings as follows:

1. Click the drop box for variable to be changed. The adjustable variables are month, day, year, hours, minutes, AM/PM, and (time) zone. A drop-down scroll box appears (the year drop box is selected in figure 57).
2. Click and drag the slider or click the scroll up button or the scroll down button until the desired variable is visible.
3. Click the desired variable.

   NOTES:
   - If setting the time, set the local time. The **Zone** variable allows you to then enter the offset from Greenwich Mean Time (GMT).
   - The Zone field identifies the standard time zone selected and displays the amount of time, in hours and minutes, that the local time varies from the GMT international time reference.

4. Repeat steps **1** through **3** for other variables that need to be changed.
5. If appropriate, select the appropriate **Daylight Saving** radio button to turn on the daylight savings time feature for your region or nation.

   NOTE: When Daylight Saving Time is turned on, the switcher automatically updates its internal clock between Standard Time and Daylight Saving Time in the spring and fall on the date that the time change occurs in the country or region selected. When Daylight Saving Time is turned off, the switcher does not adjust its time reference.

6. Click the **Submit** button at the bottom of the Date/Time Settings area.

Video Input Settings Page

Access the Video Input Settings page (figure 58) by clicking the **Video Input Settings** link on the System Settings page.

Low resolution video inputs 11 through 14 are individually configurable as either composite video or S-video. View and change this variable by clicking in the desired radio button for the input that needs to be changed.

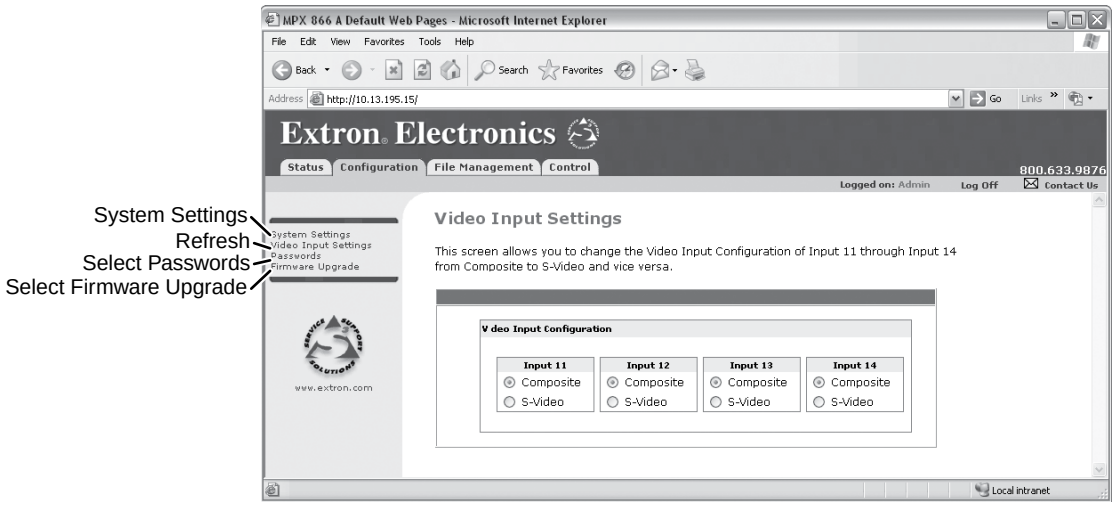


Figure 58. Video Input Settings Page

Passwords Page

Access the Passwords page (see figure 59) by clicking the **Passwords** link on the System Settings page.

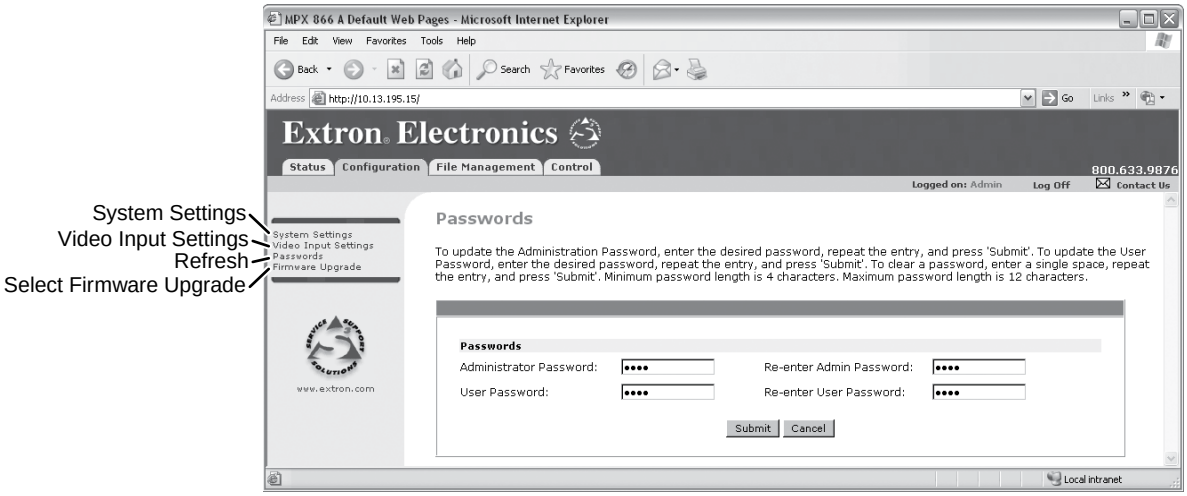

System Settings
Video Input Settings
Refresh
Select Firmware Upgrade
MPX 866 A Default Web Pages - Microsoft Internet Explorer
Extron Electronics
Status
Configuration
File Management
Control
800.633.9876
Passwords
To update the Administration Password, enter the desired password, repeat the entry, and press 'Submit'. To update the User Password, enter the desired password, repeat the entry, and press 'Submit'. To clear a password, enter a single space, repeat the entry, and press 'Submit'. Minimum password length is 4 characters. Maximum password length is 12 characters.
Passwords
Administrator Password:
Re-enter Admin Password:
User Password:
Re-enter User Password:
Submit
Cancel
www.extron.com

Figure 59. Passwords Page

The fields on the Passwords page are for entering and verifying administrator and user passwords. Passwords are case sensitive and are limited to 12 upper-case and lower-case alphanumeric characters. Each password must be entered twice: once in the **Password** field and then again in the **Re-enter Password** field. Characters in these fields are masked by asterisks (*****). If you do not want to password protect an access level, leave the **Password** field and the **Re-Enter Password** field blank. After entering the desired password in both fields, click the **Submit** button.

NOTE: An administrator password must be created before a user password can be created.

To clear an existing password so that no password is required, enter a single space character in the **Password** and **Re-enter Password** fields, and click the **Submit** button.

Firmware Upgrade Page

The **Firmware Upgrade** page provides a way to replace the firmware that is coded on the control board of the switcher without taking the switcher out of service. Access the Firmware Upgrade page (see figure 60) by clicking the **Firmware Upgrade** link on the System Settings page.

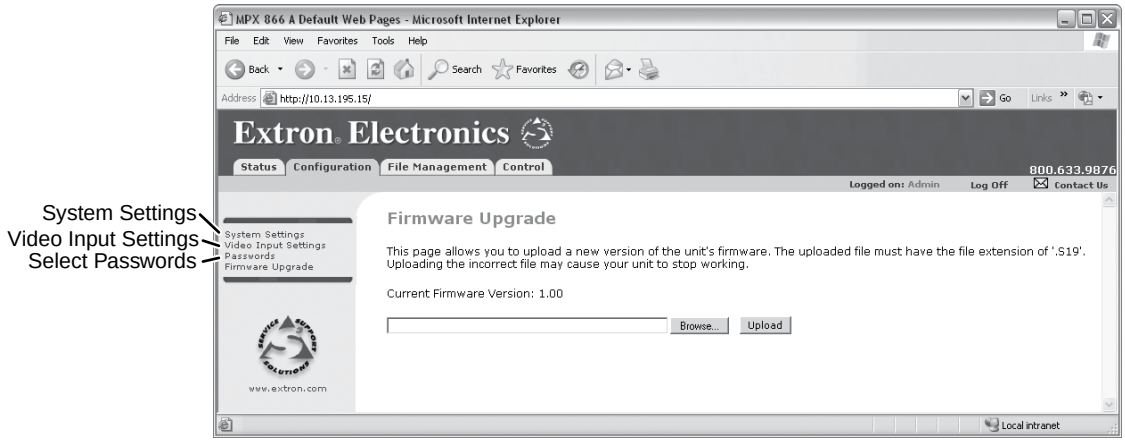


Figure 60. Firmware Upgrade Page

Update the switcher firmware as follows:

NOTE: The Firmware Upgrade page is **only** for replacing the firmware that controls all switcher operation. To insert your own custom HTML pages, see "**File Management Page**".

1. Visit the Extron website, **www.extron.com**, select the MPX 866 A matrix switcher product category, select the latest firmware installation package (*.exe file) for the switcher, and download the file. Note the folder to which you save the firmware file.
2. Run the executable (*.exe) file to decompress the firmware file.
3. Connect the PC to the MPX 866 A matrix switcher via the LAN port of the switcher.
4. Access the MPX 866 A matrix switcher using HTML pages.
5. Click the **Configuration** tab.
6. Click the **Firmware Upgrade** link (figure 61).

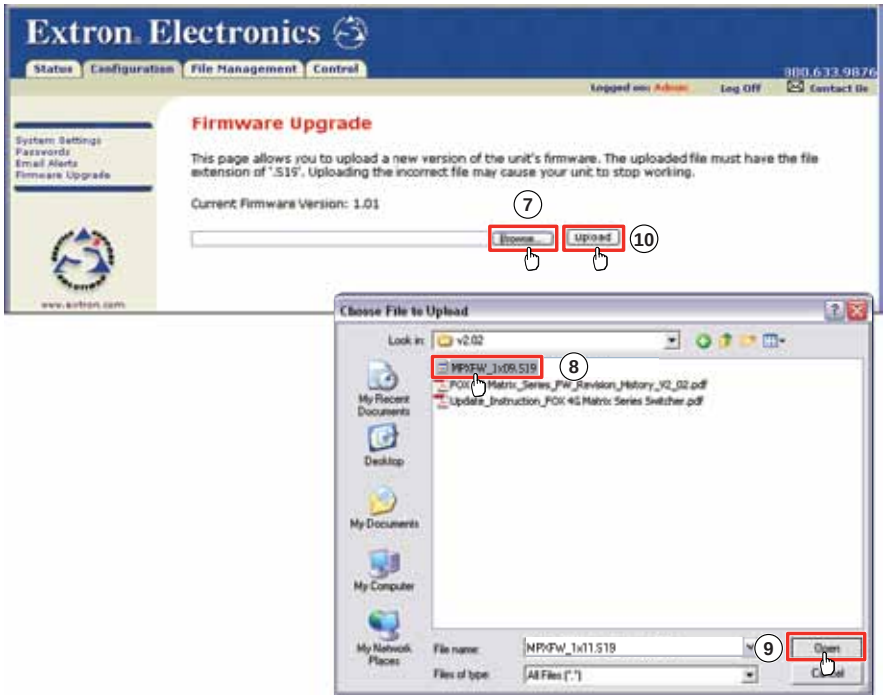


Figure 61. Firmware Upgrade

7. Click the **Browse** button. A **Choose File to Upload** window appears.
8. Navigate to the folder where you saved the firmware upgrade file. Select the file.

NOTES:
- Valid firmware files must have the file extension ".S19." A file with any other extension is not a firmware upgrade.
- The original factory-installed firmware is permanently available on the MPX 866 A matrix switcher. If the attempted firmware upload fails for any reason, the switcher automatically reverts to the factory-installed firmware.

9. Click the **Open** button.
10. Click the **Upload button**. The firmware upload to the MPX 866 A matrix switcher may take a few minutes.

File Management Tab

File Management Page

To delete files such as HTML pages from the switcher or to upload your own files to the switcher, click the **File Management** tab. The switcher downloads the File Management HTML page (see figure 62).

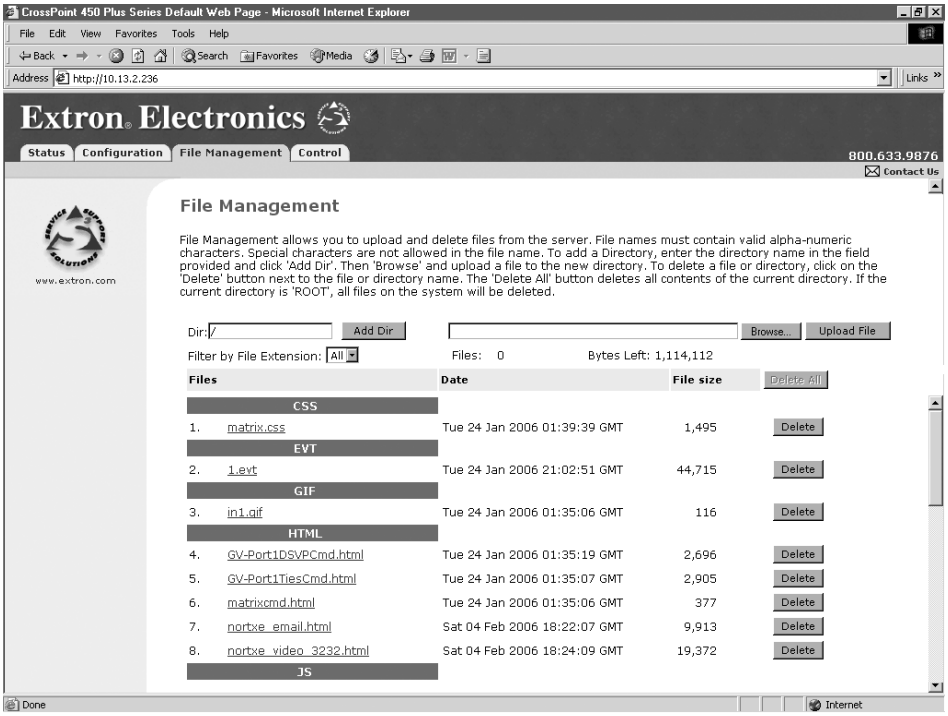

CrossPoint 450 Plus Series Default Web Page - Microsoft Internet Explorer
Extron Electronics
Status
Configuration
File Management
Control
800.633.9876
Contact Us
www.extron.com
File Management
File Management allows you to upload and delete files from the server. File names must contain valid alpha-numeric characters. Special characters are not allowed in the file name. To add a Directory, enter the directory name in the field provided and click 'Add Dir'. Then 'Browse' and upload a file to the new directory. To delete a file or directory, click on the 'Delete' button next to the file or directory name. The 'Delete All' button deletes all contents of the current directory. If the current directory is 'ROOT', all files on the system will be deleted.
Dir:/
Add Dir
Browse...
Upload File
Filter by File Extension: All
Files: 0
Bytes Left: 1,114,112
Files
Date
File size
Delete All
CSS
1. matrix.css Tue 24 Jan 2006 01:39:39 GMT 1,495 Delete
EVT
2. 1.evt Tue 24 Jan 2006 21:02:51 GMT 44,715 Delete
GIF
3. in1.gif Tue 24 Jan 2006 01:35:06 GMT 116 Delete
HTML
4. GV-Port1DSVPCmd.html Tue 24 Jan 2006 01:35:19 GMT 2,696 Delete
5. GV-Port1TiesCmd.html Tue 24 Jan 2006 01:35:07 GMT 2,905 Delete
6. matrixcmd.html Tue 24 Jan 2006 01:35:06 GMT 377 Delete
7. nortxe_email.html Sat 04 Feb 2006 18:22:07 GMT 9,913 Delete
8. nortxe_video_3232.html Sat 04 Feb 2006 18:24:09 GMT 19,372 Delete
JS
Done
Internet

Figure 62. File Management Page

NOTE: The files listed in figure 62 are shown for example only and may not be present on your switcher.

To delete a file, click the **Delete** button associated with that file.

Upload your own files as follows:

NOTE: The following characters are invalid or not recommended in file names: {space} + ~ , @ = ‘ [ ] { } < > ’ “ ” ; : | \ and ?.

1. Click the **Browse** button.
2. Browse through your system and select the desired file or files.

   NOTE: If you want one of the pages that you create and upload to be the default startup page, name that file “index.html”.

3. Click the **Upload File** button. The file or files that you selected appear in the list.

Control Tab

Set and View Ties Page

You can create ties on the Set and View Ties page (see figure 63). Access the Set and View Ties page by clicking the **Control** tab.

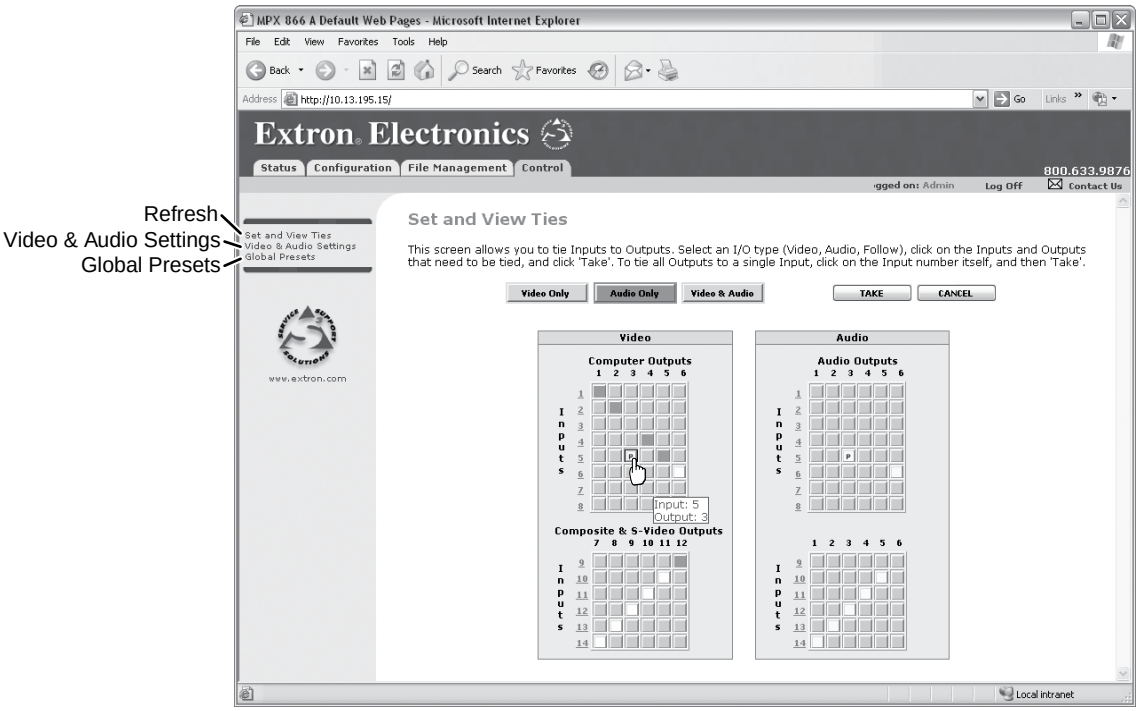


Figure 63. Set and View Ties Page

The page consists of a matrix of input (rows) and output (columns) selection buttons of four different colors:

- The **amber** buttons indicate **video and audio** ties.
- The **green** buttons indicate **video only** ties.
- The **red** buttons indicate **audio only** ties.
- The **gray** buttons indicate **no ties**.

NOTES:

- Video ties can only be made **within** the following groups, never **between** the groups:
  - The computer video group (inputs 1 through 8 and outputs 1 through 6)
  - The low resolution video group (inputs 9 through 14 and outputs 7 through 12)
- Audio can be tied only to outputs 1 through 6. If you make a video and audio tie from the low resolution video group (inputs 9 through 14), audio is automatically redirected to tie it and output in the computer subgroup (outputs 1 through 6).
- See "**Creating a Configuration**, on page 24" to identify the outputs to which audio inputs are tied.
- If you lose track of the input and output associated with a specific button, let the mouse pointer rest over a button for a moment. As shown on figure 63, a field pops up that identifies the input and output for that button.

Creating or deleting a tie

Make or break a tie as follows:

1. Click the **`Video Only`**, **`Audio Only`**, or **`Video & Audio`** button to select video, audio, or both for switching (audio follow or audio breakaway). Each mouse click on a button toggles the other two buttons off.
2. Move the mouse over the matrix of input and output selection buttons. Click a button to:
   - Create a pending tie (if a tie does not exist) of the input and output associated with that button.
   - Create a pending untie (if a tie exists) of the input and output associated with that button.

   A "P" (for pending) appears in the button.

   NOTE: To tie an input to all outputs, click the input number for that input.
3. Click the **`Take`** button to make the configuration changes or the **`Cancel`** button to abandon the configuration changes.

RGB and Audio Settings Page

The RGB and Audio Settings page provides a way to set the input audio gain and attenuation, set the output volume, and mute and unmute all video and audio outputs. Access the RGB and Audio Settings page (see figure 64) by clicking the RGB & Audio Settings link on the Control page.

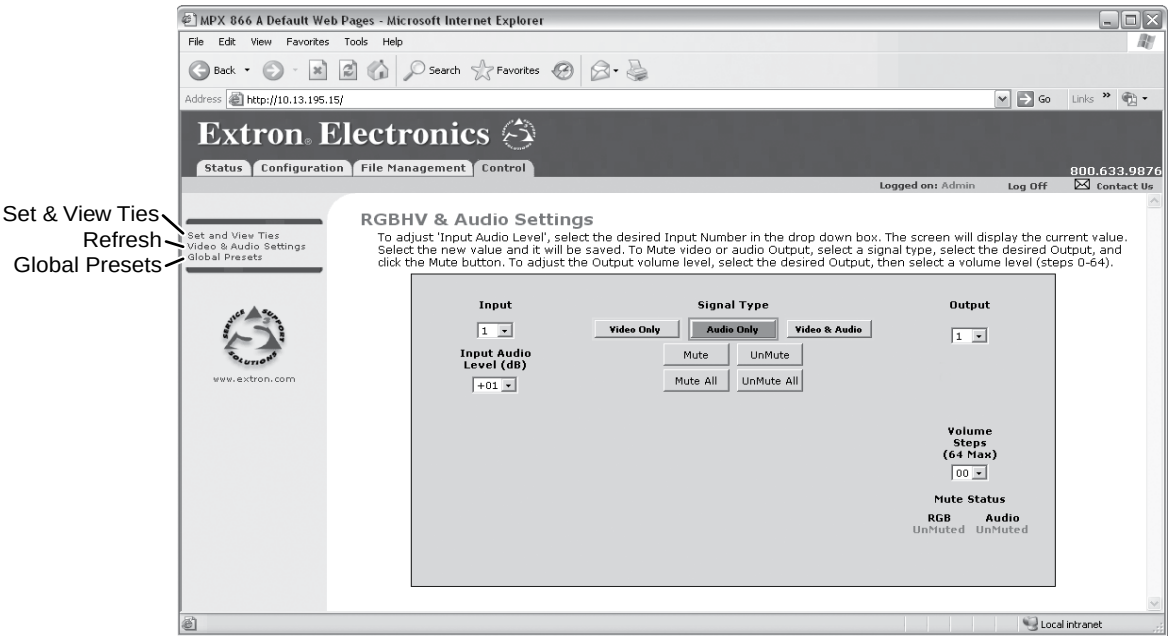

Set & View Ties
Refresh
Global Presets
MPX 866 A Default Web Pages - Microsoft Internet Explorer
Extron Electronics
Status
Configuration
File Management
Control
800.633.9876
Logged on: Admin
Log Off
Contact Us
Set and View Ties
Video & Audio Settings
Global Presets
RGBHV & Audio Settings
To adjust 'Input Audio Level', select the desired Input Number in the drop down box. The screen will display the current value. Select the new value and it will be saved. To Mute video or audio Output, select a signal type, select the desired Output, and click the Mute button. To adjust the Output volume level, select the desired Output, then select a volume level (steps 0-64).
Input
Signal Type
Output
Video Only
Audio Only
Video & Audio
Input Audio Level (dB)
+01
Mute
UnMute
Mute All
UnMute All
Volume Steps (64 Max)
Mute Status
RGB UnMuted
Audio UnMuted
www.extron.com
Local intranet

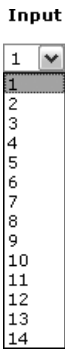
Figure 64. RGB and Audio Settings Page

Change the input gain and attenuation

Users can set the level of audio gain or attenuation (-18 dB to +24 dB) for each input from the RGB and Audio Settings page. Audio levels can be adjusted so there are no noticeable volume differences between sources.

Change an audio level setting as follows:

1. Click the Input drop box. A drop down scroll box appears).
2. Click the desired input.



3. Click the Input Audio Level (dB) drop box. A drop down scroll box appears (see figure 65).

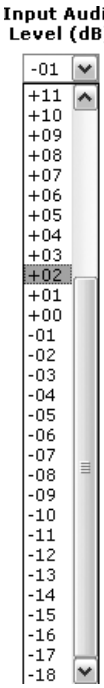


Figure 65. Gain Drop Box

4. Click and drag the slider or click the scroll up button or scroll down button until the desired audio level is visible.
5. Click the desired gain or attenuation value.

Mute and unmute one or all outputs

Mute one or all outputs as follows:

1. To select an individual output to mute or unmute, click the Output drop box. A drop down scroll box appears (see figure 66).

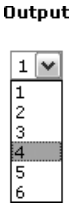


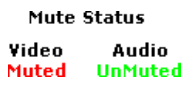
Figure 66. Output Selection Drop Box

2. Click the desired output.
3. Click the **Video**, **Audio**, or **Video & Audio** button to select video, audio, or both for muting. Each mouse click on a button toggles the other two buttons off.

4. Click the **Mute** or **UnMute** button to mute or unmute the selected output.

Click the **Mute All** or **UnMute All** to mute or unmute all of the outputs.

Observe the Mute status indications on the page. Unmuted is displayed in green and muted is displayed in red.



Change the output volume level

Users can set the volume level for each output through a range of zero steps of attenuation (full attenuation, minimum volume) to 64 steps of attenuation (no attenuation, full volume) from the RGB and Audio Settings page.

Change an audio level setting as follows:

1. Click the output drop box. A drop down scroll box appears.
2. Click the desired output.
3. Click the Volume Steps (64 Max) drop box. A drop down scroll box appears (see figure 67).

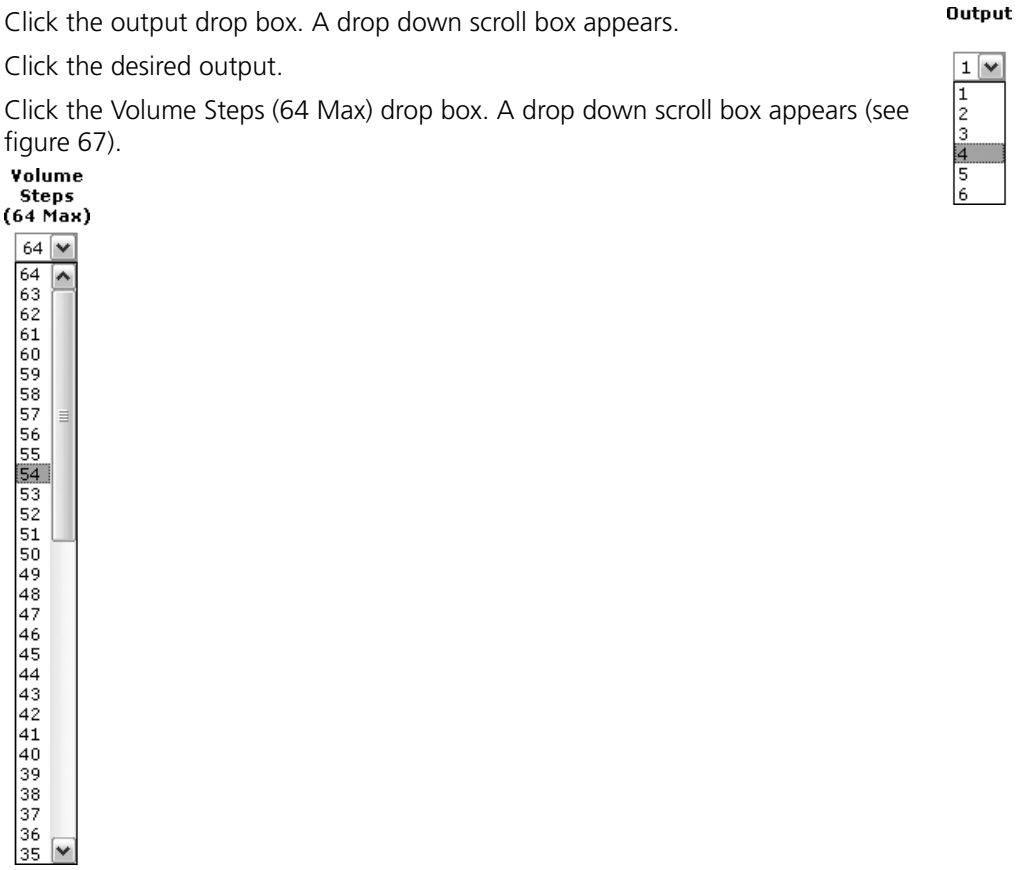


Figure 67. Volume Drop Box

4. Click and drag the slider or click the scroll up button or scroll down button until the desired audio volume is visible.
5. Click the desired output volume step value.

NOTE: The table on page 67 defines the value of each audio volume step. The X8 references in the table are SIS command variable only and have no meaning for HTML volume adjustment.

Global Presets Page

You can save and recall global presets from the Global presets page (see figure 68). Access the Global presets page by clicking the **Global Presets** link on the left of the Control page.

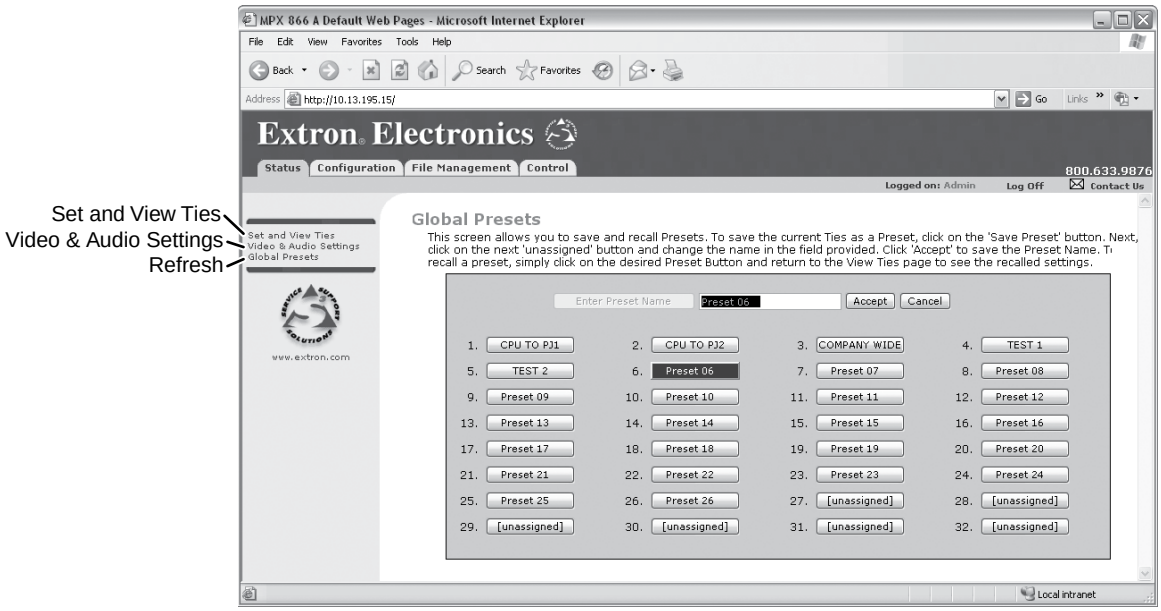


Figure 68. Global Presets Page

Saving a preset

Save the current configuration (configuration 0) as a preset as follows:

1. Click the **Save Preset** button.
2. Select the desired preset by clicking on one of the presets listed. To create a new preset, click one of the [unassigned] buttons. Clicking a button for an already-assigned preset overwrites the previous preset.
3. If desired, rename the preset by typing over the current name in the box adjacent to the **Save Preset** button.

   NOTES:
   - Preset names are limited to up to 12 upper and lower case alphanumeric characters.
   - The following characters are invalid or not recommended in preset names: + ~ , @ = ‘ [ ] { } < > ’ “ ; : | \ and ?.

   If you do not rename an unassigned button, the MPX 866 A matrix switcher names the preset as Preset {*the selected preset number*}, “Preset 08” for example.

   If you do not rename an existing preset when it is overwritten, the MPX 866 A matrix switcher retains the same name.
4. Click the **Accept** button.

Recalling a preset

To recall a global preset to be the current configuration, click the button associated with the desired preset.

Special Characters

The HTML language reserves certain characters for specific functions. The switcher does not accept these characters as part of preset names, the name of the switcher, passwords, or locally created file names.

The switcher rejects the following characters or they are not recommended:
{space} + ~ , @ = ‘ [ ] { } < > ’ “ ” ; (semicolon) : (colon) | \ and ?.

Ethernet Connection

This section provides a high level discussion of the Ethernet connection to the switcher and a primer on the subject of subnetting. Topics that are covered, include:

- Ethernet Link
- Subnetting — A Primer

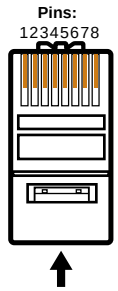
Ethernet Link

The rear panel Ethernet connector on the MPX 866 A matrix switcher can be connected to an Ethernet LAN or WAN. This connection makes SIS control of the switcher possible using a computer connected to the same LAN.

Ethernet Connection

The Ethernet cable can be terminated as a straight-through cable or a crossover cable and must be properly terminated for your application (see figure 69).

- **Crossover cable —** Direct connection between the computer and the MPX 866 A matrix switcher
- **Patch (straight-through) cable —** Connection of the MPX 866 A matrix switcher to an Ethernet LAN



Crossover Cable

Pin	End 1 Wire color	End 2 Wire color
1	White-green	White-orange
2	Green	Orange
3	White-orange	White-green
4	Blue	Blue
5	White-blue	White-blue
6	Orange	Green
7	White-brown	White-brown
8	Brown	Brown
	T568A	T568B

A cable that is wired as T568A at one end and T568B at the other (Tx and Rx pairs reversed) is a "crossover" cable.

Straight-through Cable

Pin	End 1 Wire color	End 2 Wire color
1	White-orange	White-orange
2	Orange	Orange
3	White-green	White-green
4	Blue	Blue
5	White-blue	White-blue
6	Green	Green
7	White-brown	White-brown
8	Brown	Brown
	T568B	T568B

A cable wired the same at both ends is called a "straight-through" cable, because no pin/pair assignments are swapped.

Figure 69. RJ-45 Connector Pinout Tables

Default IP Address

To access the MPX 866 A matrix switcher via the LAN port, you need the IP address of the switcher. If the address has been changed to an address comprised of words and characters, you can determine the actual numeric IP address using the ping utility. If the address has not been changed, the factory-specified default is 192.168.254.254.

Ping can also be used to test the Ethernet link to the MPX 866 A matrix switcher.

Pinging to Determine the Extron IP Address

The ping utility is available at the Command prompt. Ping tests the Ethernet interface between the computer and the MPX 866 A matrix switcher. Ping can also be used to determine the actual numeric IP address from an alias and to determine the web address.

Ping the switcher as follows:

1. On the Windows task bar, click on **`Start`** > **`Run`**.
2. At the `Open` prompt, type `command`.
3. Click the **`OK`** button.
4. At the Command prompt, type `ping {`*`IP address`*`}` and then press <Enter>. The computer returns a display similar to the one shown in see figure 70.

   The line `Pinging ...` reports the actual numeric IP address, regardless of whether you entered the actual numeric IP address or an alias name.

```
C:\>ping 192.168.254.254

Pinging 192.168.254.254 with 32 bytes of data:

Reply from 192.168.254.254: bytes=32 time<10ms TTL=128
Reply from 192.168.254.254: bytes=32 time<10ms TTL=128
Reply from 192.168.254.254: bytes=32 time<10ms TTL=128
Reply from 192.168.254.254: bytes=32 time<10ms TTL=128

Ping statistics for 192.168.254.254:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Figure 70. Typical Ping Response

Pinging to Determine the Web IP Address

The ping utility has a modifier, `-a`, that directs the command to return the web address rather than the numeric IP address.

At the Command prompt, type `ping -a {`*`IP address`*`}` and then press <Enter>. The return display is similar to the ping response shown in figure 70, except that when you specify the `-a` modifier, the line `Pinging mail...` reports the web IP address rather than the numeric IP address, regardless of whether you entered the actual numeric IP address or an alias name.

Configuring the MPX 866 A Matrix Switcher for Network Use via the ARP Command

The ARP (address resolution protocol) command tells your computer to associate the MAC (media access control) address of the MPX 866 A matrix switcher with the assigned IP address. You must then use the ping utility to access the controller, at which point the IP address of the controller is reconfigured.

Use ARP to configure the IP address as follows:

1. Obtain a valid IP address for the MPX 866 A matrix switcher from your network administrator.
2. Obtain the MAC address (UID #) of the MPX 866 A matrix switcher from the label on its rear panel. The MAC address should have this format: 00-05-A6-*xx-xx-xx*.
3. If the MPX 866 A matrix switcher has never been configured and is still set for factory defaults, proceed to step **4**. If not, perform a mode 4 system reset and then proceed to step **4**. For detailed information on reset modes, see **Performing Soft System Resets (Resets 3, 4, and 5)**.

   NOTE: The MPX 866 A matrix switcher must be configured with the factory default IP address (192.168.254.254) before the ARP command is executed, as described below.

4. At the PC, access the Command prompt (see **Pinging to Determine the Extron IP Address**, steps **1** through **3**), then enter the `arp –s` command. Type in the desired new IP address for the unit (obtained in step **1**) and the MAC address of the unit (from the rear panel of the unit), for example
   `arp –s 10.13.197.7 00-05-A6-03-69-B0` and then press {Enter}.

   The computer returns the command prompt (`C:\`).

   After you issue the `arp -s` command, the controller changes to the new address and starts responding to the ping requests to the new address, as described in the next step.

   NOTE: You must ping the MPX 866 A matrix switcher for the IP address change to take place. The response should show the new IP address, as shown in figure 71.

5. Execute a ping command by entering ping followed by a space and the new IP address at the command prompt. For example:

   `ping 10.13.197.7`

```
C:\>ping 10.13.197.7

Pinging 10.13.197.7 with 32 bytes of data:

Reply from 10.13.197.7: bytes=32 time<10ms TTL=128
Reply from 10.13.197.7: bytes=32 time<10ms TTL=128
Reply from 10.13.197.7: bytes=32 time<10ms TTL=128
Reply from 10.13.197.7: bytes=32 time<10ms TTL=128

Ping statistics for 10.13.197.7:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Figure 71. Ping with New Address

NOTE: You can reconnect using either Telnet or a web browser to verify that the update was successful.

6. After verifying that the IP address change was successful, enter and issue the arp –d command at the Command prompt. For example:

   `arp –d 10.13.197.7` removes 10.13.197.7 from the ARP table

   or

   `arp –d*` removes all static IP addresses from the ARP table.

Connecting as a Telnet Client

The Microsoft Telnet utility is available from the Command prompt. Telnet allows you to input SIS commands to the MPX 866 A matrix switcher from the PC via the Ethernet link and the LAN.

Access the Command prompt and start Telnet as follows:

1. On the Windows task bar, click **`Start`** > **`Run`**.
2. At the `Open` prompt, type `command`.
1. Click the **`OK`** button.
2. At the Command prompt, type `Telnet` and then press <`Enter`>. The computer returns a display similar to the one shown in figure 72.

```
Microsoft (R) windows 2000 (TM) Version 5.0 (Build 2195)
Welcome to Microsoft Telnet Client
Telnet Client Build 5.00.99203.1

Escape Character is 'CTRL+]'

Microsoft Telnet>
```

Figure 72. Telnet Window

Telnet Tips

It is not the intention of this guide to detail all of the operations and functionality of Telnet; however, some basic level of understanding is necessary for operating the MPX 866 A matrix switcher via Telnet.

Open

Connect to the MPX 866 A matrix switcher using the Open command. Once you are connected to the switcher, you can enter the SIS commands the same as you would if you were using the RS-232 of RS-422 link.

Connect to the MPX 866 A matrix switcher as follows:

1. At the Telnet prompt, type `open {IP address}` and then press <Enter>.

   If the switcher is not password protected, no further prompts are displayed until you break or disconnect the connection to the matrix switcher.

   If the switcher is password protected, Telnet displays the password prompt.

2. If necessary, at the password prompt, type the appropriate password and then press <Enter>.

   Connection to the switcher via the Ethernet can be password protected. There are two levels of password protection: administrator and user. A person logged on as an administrator has full access to all matrix switcher switching capabilities and editing functions. Users can create ties, set mutes, and view all settings with the exception of passwords. By default, the MPX 866 A matrix switcher is shipped with both passwords set to {*carriage return*}.

   Once you are logged in, the switcher returns either `Login Administrator` or `Login User`. No further prompts are displayed until you break or disconnect the connection to the MPX 866 A matrix switcher.

Escape character and Esc key

When Telnet is first started, the utility advises that the Escape character is '`Ctrl+]`'. Many SIS commands include the keyboard <Esc> key. Consequently, some confusion may exist between the Escape character and the Escape key.

The Telnet Escape character is a key combination, the <Ctrl> key and the <]> key pressed simultaneously, which returns you to the Telnet prompt while leaving the connection to the MPX 866 A matrix switcher intact.

The Escape key is the <Esc> key on the computer keyboard.

Local echo

Once connected to the MPX 866 A matrix switcher, by default, Telnet does not display your keystrokes on the screen. SIS commands are typed in blindly and only the SIS responses are displayed on the screen. To command Telnet to show keystrokes, at the Telnet prompt, type `set local_echo` and then press <Enter> before you open the connection to the switcher.

With local echo turned on, keystrokes and the responses of the switcher are displayed on the same line. For example: `1*1!In1 Out1 All`, where `1*1!` is the SIS command and `In1 Out1 All` is the response.

With local echo turned on, all keystrokes are displayed, even those that should be masked, such as the password entry. For example, when entering a password with local echo turned on, you see a display such as `a*d*m*i*n*`, where `admin` is the keyed in password and `*****` is the masked response.

You can turn off local echo by typing `unset local_echo` and then pressing <Enter> at the Telnet prompt. If you are connected to the MPX 866 A matrix switcher and need to access the Telnet prompt to turn local echo off, type the Escape character (<Ctrl>+<]>).

Set carriage return-line feed

Unless commanded otherwise, Telnet transmits a line feed character only (no carriage return) to the connected switcher when you press the <Enter> key. This is the correct setting for SIS communication with the switcher. The Telnet `set crlf` command forces Telnet to transmit carriage return and line feed characters when <Enter> is pressed, but if crlf is set, the SIS link with the switcher does not function properly.

Close

To close the link to the switcher, access the Telnet prompt by typing the Escape character (<Ctrl>+<]>). At the Telnet prompt, type close, and then press <Enter>.

Help

For Telnet command definitions, at the Telnet prompt, type `?` and then press <Enter>.

Quit

Exit the Telnet utility by typing `quit` and then pressing <Enter> at the Telnet prompt. If you are connected to the MPX 866 A matrix switcher, access the Telnet prompt by typing the Escape character (<Ctrl>+<]>).

Subnetting — A Primer

It is not the purpose of this guide to describe TCP/IP protocol in detail. However, some understanding of TCP/IP subnetting (a subnet is a **sub**set of a **net**work — a set of IP devices that have portions of their IP addresses in common) is necessary in order to understand the interaction of and another server gateway. To understand subnetting at the level required to install and operate the switcher, you must understand the concepts of a gateway, local and remote devices, IP addresses and octets, and subnet masks and octets.

Gateways

The MPX 866 A switcher can communicate with the a controlling computer directly (if they are on the same subnet) or the communication can be routed via a gateway (a computer that provides a link between different subnets).

Local and Remote Devices

The local and remote devices are defined from the point of view of the function being described. In this guide, subnetting is an issue when you are using the controlling PC to set TCP/IP values in the switcher (see "**IP Settings/Options window**" in the Matrix Software section). When you are setting up the variables that may include subnetting, the matrix switcher is the local device and the remote server is the remote device.

IP Addresses and Octets

Valid IP addresses consist of four 1-, 2-, or 3-digit numeric subfields, properly called "octets," separated by dots (periods) (see figure 73). Each octet can be numbered from 000 through 255. Leading zeroes, up to three digits total per octet, are optional. Values of 256 and above are invalid.

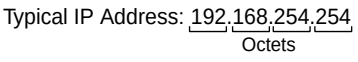


Figure 73. Typical IP Address

Subnet Masks and Octets

The subnet mask (see figure 74) is used to determine whether the local and remote devices are on the same subnet or different subnets. The subnet mask consists of four numeric octets separated by dots. Each octet can be numbered from 000 through 255. Leading zeroes, up to three digits total per octet, are optional. Each octet typically contains either 255 or 0. The octets determine whether or not the same octets of two IP addresses will be compared when determining if two devices are on the same subnet.

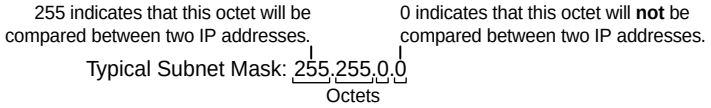

255 indicates that this octet will be compared between two IP addresses.
0 indicates that this octet will **not** be compared between two IP addresses.
Typical Subnet Mask: 255.255.0.0
Octets

Figure 74. Typical Subnet Mask

Determining Whether Devices Are on the Same Subnet

To determine the subnet, the IP address of the local device is compared to the IP address of the remote device (see figure 75). The octets of each address are compared or not compared, depending on the value in the related subnet mask octet.

- If a subnet mask octet contains the value 255, the related octets of the IP addresses of the local device and the remote device are unmasked.

  Unmasked octets are compared (indicated by ? in figure 75).

- If the subnet mask octet contains the value 0, the related octets of the IP addresses of the local device and remote device are masked.

  Masked octets are not compared (indicated by X in figure 75)**.**

If the unmasked octets of the two IP addresses **match** (indicated by = in figure 75, example 1), the two addresses **are on the same subnet**.

If the two unmasked fields **do not match** (indicated by ≠ in figure 75, example 2 and example 3), the addresses **are not on the same subnet**.

	Example 1	Example 2	Example 3
Local IP Address:	192.168.254.254	192.168.254.254	192.168.254.254
Subnet Mask:	255.255.0.0 (*?.?.X.X*)	255.255.0.0 (*?.?.X.X*)	255.255.0.0 (*?.?.X.X*)
Remote IP Address:	192.168.2.25	190.190.2.25	192.190.2.25
Match?:	=.=.*X.X* — Match (Same subnet)	≠.≠.*X.X* — No match (Different subnet)	=.≠.*X.X* — No match (Different subnet)

Figure 75. Comparing the IP Addresses of the Local and Remote Devices

Reference Information

This section discusses the specifications, part numbers, and accessories for the MPX 866 A Media Presentation Matrix Switcher. Topics that are covered include:

- **Specifications**
- **Part Numbers**
- **Mounting the Switcher**
- **Button Labels**

Specifications

Video

Routing	
RGB/VGA	8 x 6 matrix
S-video/composite video	6 x 6 matrix
Gain	Unity
Bandwidth	
RGB/VGA	300 MHz (-3 dB), fully loaded
S-video/composite video	150 MHz (-3 dB), fully loaded
0 - 10 MHz	No more than +0.1 dB to -0.1 dB
0 - 30 MHz	No more than +0.1 dB to -0.5 dB
Differential phase error	1.0° at 3.58 MHz and 4.43 MHz
Differential gain error	1.0% at 3.58 MHz and 4.43 MHz
Crosstalk	
RGB/VGA	<-50 dB @ 10 MHz, <-30 dB @ 100 MHz
S-video/composite video	-50 dB @ 5 MHz
Switching speed	100 ms (max.)

Video input

Number/signal type	
RGB/VGA	8 VGA-QXGA RGBHV, RGBS, RGsB, RsGsBs, component video (bi-level or tri-level sync), S-video, or composite video
S-video/composite video	Up to 4 S-video and 2 composite video *or* 6 composite video
Connectors	
RGB/VGA	8 female 15-pin HD
S-video/composite video	4 x 2 female BNC for S-video or composite video (inputs 11 to 14) and 2 x 1 female BNC for composite video or genlock only (inputs 9 and 10)
Nominal level	1 Vp-p for Y of component video and S-video and for composite video 0.7 Vp-p for RGB and R-Y and B-Y of component video 0.3 Vp-p for C of S-video
Minimum/maximum levels	
RGB/VGA	Analog: 0.3 V to 1.5 Vp-p with no offset
S-video/composite video	Analog: 0.5 V to 2.0 Vp-p with no offset
Impedance	75 ohms
Horizontal frequency (RGB)	15 kHz to 145 kHz
Vertical frequency (RGB)	30 Hz to 170 Hz

Return loss
- RGB/VGA..... <-40 dB @ 5 MHz
- S-video/composite video ..... <-30 dB @ 5 MHz

DC offset (max. allowable, S-video or composite video)
1.5 V

External sync (genlock, S-video or composite video)
0.3 V to 0.4 Vp-p

Video output

Number/signal type
- RGB/VGA..... 6 VGA-QXGA RGBHV, RGBS, RGsB, RsGsBs, component video (b-level or tri-level sync), S-video, or composite video (follows input type)
- S-video/composite video ..... 2 S-video, 2 S-video or composite video, and 2 composite video

Connectors
- RGB/VGA..... 6 female 15-pin HD
- S-video/composite video ..... 2 x 2 female BNC for S-video only (outputs 9 and 10)
  2 x 2 female BNC for S-video or composite video pass-through (outputs 11 and 12)
  2 x 1 female BNC for composite video only (outputs 7 and 8)

Nominal level ..... 1 Vp-p for Y of component video and S-video and for composite video
0.7 Vp-p for RGB and R-Y and B-Y of component video
0.3 Vp-p for C of S-video

Minimum/maximum levels
- RGB/VGA..... Analog: 0.3 V to 1.5 Vp-p with no offset (follows input)
- S-video/composite video ..... Analog: 0.0 V to 2.0 Vp-p with no offset

Impedance ..... 75 ohms

Return loss
- RGB/VGA..... -40 dB @ 5 MHz
- S-video/composite video ..... -30 dB @ 5 MHz

DC offset
- S-video/composite video ..... ±5 mV with input at 0 offset
- VGA ..... ±10 mV with input at 0 offset

Switching type
- RGB/VGA..... Triple-Action
- S-video/composite video ..... Vertical interval

Sync

Input type (VGA group)..... RGBHV, RGBS, RGsB, RsGsBs
Output type (VGA group)..... RGBHV, RGBS, RGsB, RsGsBs (follows input)
Genlock connector..... 1 female BNC (video input 9)
Standards..... NTSC 3.58, NTSC 4.43, PAL, SECAM
Input level ..... 1.9 V to 5.0 Vp-p
Output level ..... TTL: 5.0 Vp-p, unterminated for RGBHV, RGBS
Input impedance ..... 510 ohms
Output impedance ..... 75 ohms
Max. input voltage ..... 5.0 Vp-p
Max. propagation delay..... 30 ns
Max. rise/fall time..... 4 ns
Polarity..... Positive or negative (follows input)

Audio

Routing..... 14 x 6 stereo matrix
Gain..... Unbalanced output: -6 dB; balanced output: 0 dB
Frequency response..... 20 Hz to 20 kHz, ±0.05 dB
THD + Noise..... 0.03% @ 1 kHz, 0.3% @ 20 kHz at nominal level
S/N..... >85 dB, balanced, at maximum output (21 dBu) (unweighted)
Crosstalk ..... <-120 dB @ 1 kHz, fully loaded
Stereo channel separation ..... >80 dB @ 1 kHz
CMRR ..... >75 dB @ 20 Hz to 20 kHz
Volume range..... -76 dB to 0 dB (volume numbers 0 to 64 in 1.0 dB steps)

NOTE: Full attenuation is volume level 0, -76 dB. The default is -0 dB, volume level 64.

Audio input

Number/signal type	14 stereo, balanced/unbalanced
Connectors	(14) 3.5 mm captive screw connectors, 5 pole
Impedance	>25k ohms unbalanced, 50k ohms balanced, DC coupled
Nominal level	-10 dBV (316 mVrms)
Maximum level	+20 dBu, (balanced or unbalanced) at 1% THD+N
Input gain adjustment	–18 dB to +24 dB, adjustable per input by RS-232, Ethernet, or front panel

NOTE: 0 dBu = 0.775 Vrms, 0 dBV = 1 Vrms, 0 dBV ≈ 2 dBu.

Audio output

Number/signal type	6 stereo, balanced/unbalanced
Connectors	(6) 3.5 mm captive screw connectors, 5 pole
Impedance	50 ohms unbalanced, 100 ohms balanced
Gain error	±0.1 dB channel to channel
Maximum level (Hi-Z)	>+20 dBu, balanced or unbalanced at 1% THD+N

Control/remote — switcher

Serial host control port	(2) RS-232: 2 rear panel 3.5 mm captive screw connectors, 3 pole; 1 front panel 2.5mm stereo mini jack (in parallel with the rear panel secondary port)
Baud rate and protocol	9600 baud; 8 data bits, 1 stop bit, no parity
Serial control pin configurations	Captive screw connectors: 1 = TX, 2 = RX, 3 = GND Mini stereo jack: tip = TX, ring = RX, sleeve = GND
Ethernet host control port	1 female RJ-45 connector
Ethernet data rate	10/100Base-T, half/full duplex with autodetect
Ethernet protocol	ARP, ICMP (ping), IP, TCP, DHCP, HTTP, SMTP, Telnet
Default settings	Link speed and duplex level = autodetected IP address = 192.168.254.254 Subnet mask = 255.255.0.0 Gateway = 0.0.0.0 DHCP = off
Web server	Up to 200 simultaneous sessions 1 MB nonvolatile user memory
Program control	Extron control/configuration program for Windows® Extron Simple Instruction Set (SIS™) Microsoft® Internet Explorer ver. 6 or higher, Telnet

General

Power	100 VAC to 240 VAC, 50-60 Hz, 15 watts, internal
Temperature/humidity	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing Operating: +32 to +104 °F (0 to +40 °C) / 10% to 90%, noncondensing
Cooling	Convection, vents on left and right
Mounting	
Rack mount	Yes
Enclosure type	Metal
Enclosure dimensions	3.5" H x 17.0" W x 9.4" D (2U high, full rack wide) 8.9 cm H x 43.2 cm W x 23.9 cm D (Depth excludes connectors. Width excludes rack ears.)
Product weight	15 lbs (6.8 kg)
Shipping weight	25 lbs (12 kg)
Vibration	ISTA 1A in carton (International Safe Transit Association)
Regulatory compliance	
Safety	CE, c-UL, UL
Compliances	CE, C-tick, FCC Class A, ICES, VCCI
MTBF	30,000 hours
Warranty	3 years parts and labor

NOTES:
- All nominal levels are at ±10%.
- Specifications are subject to change without notice.

Part Numbers

MPX 866 A Part Numbers

These items are included in each order for a FOX matrix switcher:

Matrix switcher part numbers	Part Number
MPX 866 A Media Presentation Matrix Switcher	60-825-01
5-pole captive screw audio connectors (qty. 20)	
3-pole captive screw serial connectors (qty. 2)	
Extron Software Products Disk (Matrix Switchers Control Program and Button-Label Generator)	
MPX 866 A Media Presentation Matrix Switcher Setup Guide	

Optional Accessories

Adapters, power supplies, labels	Part Number
MKP 1000 remote keypad	
Black	60-239-02
White	60-239-03
WT (water-tight) black	60-239-52
WT (water-tight) white	60-239-53
MCP 1000M (matrix control panel)	60-298-01
MCP 1000S (secondary control panel)	60-298-02
MKP 2000 matrix switcher X-Y remote control panel, black	60-682-02
MKP 3000, black	60-708-02
5-pole captive screw audio connectors (qty. 10)	100-460-01
3-pole captive screw serial connectors (qty. 10)	100-459-01

Cables

When using signals with a scanning frequency of 15-125 kHz and running distances of 100 feet or more, use high resolution BNC cables to achieve maximum performance.

Bulk cable and termination tools

MHR mini high resolution cable	Part Number
MHRVGA/1000 non-plenum 5-conductor, 1000' (300 m)	22-024-03
MHR-2/500 non-plenum 2-conductor, 500' (150 m)	22-123-03
MHR-2P/500 plenum 2-conductor, 500' (150 m)	22-129-03

RG6 super high resolution cable	Part Number
RG6/500 non-plenum single-conductor, 500' (150 m)	22-098-02
RG6-1000 non-plenum single-conductor, 1000' (300 m)	22-098-03
RG6P/500 plenum single-conductor, 500' (150 m)	22-164-02
RG6P/1000 plenum single-conductor, 1000' (300 m)	22-164-03

Termination tools and connectors	Part Number
15-pin HD connectors, (VGA style), qty. 10	100-070-51
CTU 300 four-in-one coax crimp termination tool	100-241-02
BNC male MHR crimp connectors, qty. 100	100-335-01
BNC male RG6 crimp connectors, qty. 100	100-339-01
CTU 100 universal compression tool (BNC, F, RCA)	100-181-01
MHR BNC compression kit (100 MHR BNC connectors)	60-538-01
RG6 BNC compression kit (100 RG6 BNC connectors)	60-538-02

Terminated cable assemblies

VGA male-to-male cables	Part Number
VGA M-M MD, 3' to 100' (0.9 m to 30.4 m) (molded)	26-238-*nn*
VGA M-M BK, 3' to 100' (0.9 m to 30.4 m) (backshell)	26-238-*nn*
VGAP M-M MD, 3' to 25' (0.9 m to 7.6 m) (molded)	26-439-*nn*
VGAP M-M BK, 35' to 100' (10.6 m to 30.4 m) (backshell)	26-439-*nn*

VGA male-to-male with audio cables	Part Number
VGA-A M-M MD, 3' to 50' (0.9 m to 15.2 m) (molded)	26-490-*nn*
VGA-A M-M BK, 3' to 50' (0.9 m to 15.2 m) (backshell)	26-490-*nn*
VGA-A 90º M-M BK/6, 6' (1.8 m) (molded)	26-510-02
VGA-A 90º Up M-M BK/3, 3' (0.9 m) (molded)	26-510-21
VGA-A 90º Up M-M BK/6, 6' (1.8 m) (molded)	26-510-22

VGA male-to-female cables	Part Number
VGA M-F MD, 3' to 100' (0.9 m to 30.4 m) (molded)	26-112-*nn*
VGA M-F BK, 3' to 100' (0.9 m to 30.4 m) (backshell)	26-112-*nn*
VGAP M-F MD, plenum 3' to 25' (0.9 m to 7.6 m) (molded)	26-438-*nn*
VGAP M-F BK, plenum 35' to 100' (10.6 m to 30.4 m) (backshell)	26-438 -*nn*

VGA male-to-female with audio cables	Part Number
VGA-A M-F MD, 3' to 50' (0.9 m to 15.2 m) (molded)	26-491-*nn*
VGA-A M-F BK, 3' to 50' (0.9 m to 15.2 m) (backshell)	26-491-*nn*
VGA-A 90º F-M BK/3, 3’ (0.9 m) (backshell)	26-509-01
VGA-A 90º Up F-M MD, 3' to 6' (0.9 m to 1.8 m) (molded)	26-509-*nn*

S-video cables	Part Number
MHR-2 SVM-M, 6' to 100' (1.8 m to 30.4 m)	26-316-*nn*
MHR-2P SVM-M, Plenum, 6' to 100' (0.9 m to 30.4 m)	26-522-*nn*

S-video/BNC adapters	Part Number
SVHSF-BNCM, S-video female to BNC male, 1' to 6' (30 cm to 1.8 m)	26-541-*nn*
SVHSF-BNCF, S-video female to BNC female, 8" (20 cm)	26-541-01
SVHSM-BNCM, S-video male to BNC male, 1' to 6' (30 cm to 1.8 m)	26-353-*nn*
SVHSM-BNCF, S-video male to BNC female, 8" (20 cm)	26-353-01

Composite video male-to-male cable	Part Number
RG6 BNC, 3' to 100' (0.9 m to 30.4 m)	26-383-*nn*

Mounting the Switcher

The MPX is housed in a rack-mountable, 2U high, metal enclosures with 19-inch rack ears.

UL Requirements

The following Underwriters Laboratories (UL) requirements pertain to the installation of the MPX matrix switcher into a wall or furniture (see figure 76).

1. **Elevated operating ambient temperature —** If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consider installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.
2. **Reduced air flow —** Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
3. **Mechanical loading —** Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
4. **Circuit overloading —** Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
5. **Reliable earthing (grounding) —** Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips.

Mounting Instructions

If desired, rack mount the switcher as follows:

1. Insert the switcher into the rack, aligning the holes in the mounting bracket with those in the rack.
2. Secure the switcher to the rack using the supplied bolts.

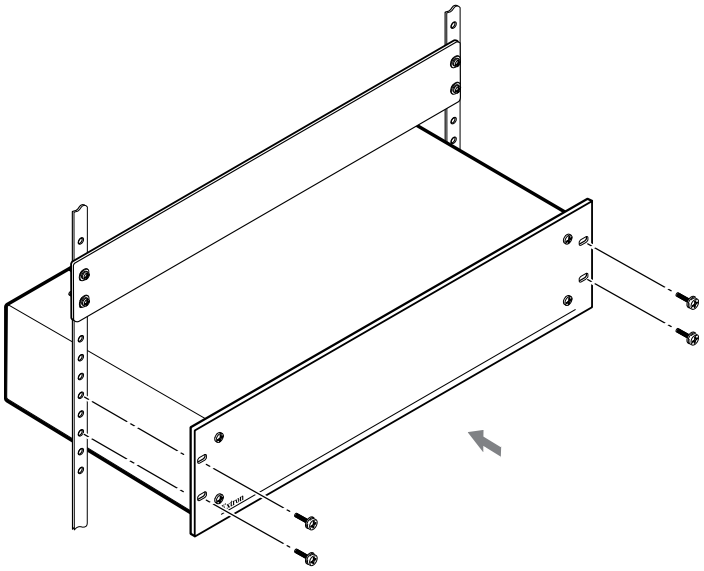


Figure 76. Installing the Switcher in a Rack

Button Labels

Figure 77 on page 128 provides blank button labels for 16-button switchers. Feel free to photocopy them or cut them out of the guide, write button information in each button area as desired, and put them in the label window of the switcher.

To remove a panel, insert the Phillips-head end of a Tweeker or small Phillips-head screwdriver into the hole in one end of the panel, and gently slide the tab at the edge of the panel out of the recess in the switcher housing.

Printing Instructions

If you print these strips to cut out and use in your switcher:

- Print on A-size, 8-1/2 inch by 11 inch (letter) paper, in portrait orientation.
- Set page scaling to None.
- After printing, verify that the printed strips fit behind the panel. Your printer configuration may cause the strip to be printed smaller or larger than specified.

Figure 77. Button Label Blanks, 16-button Switcher

Extron® Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

USA, Canada, South America, and Central America:
Extron Electronics
1001 East Ball Road
Anaheim, CA 92805
U.S.A.

Japan:
Extron Electronics, Japan
Kyodo Building, 16 Ichibancho
Chiyoda-ku, Tokyo 102-0082
Japan

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3825 PH Amersfoort
The Netherlands

China:
Extron China
686 Ronghua Road
Songjiang District
Shanghai 201611
China

Asia:
Extron Asia
135 Joo Seng Road, #04-01
PM Industrial Bldg.
Singapore 368363
Singapore

Middle East:
Extron Middle East
Dubai Airport Free Zone
F12, PO Box 293666
United Arab Emirates, Dubai

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions, or if modifications were made to the product that were not authorized by Extron.

NOTE: If a product is defective, please call Extron and ask for an Application Engineer to receive an RA (Return Authorization) number. This will begin the repair process.

USA: (714) 491-1500 **Europe**: +31.33.453.4040
Asia: +65.6383.4400 **Japan**: +81.3.3511.7655

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

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